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## Communicable Disease in the Canadian Army

J. D. ADAMSON, B.A., M.D., M.R.C.P.(E.), F.R.C.P.(C.)

*Director, Department of Medicine, University of Manitoba  
Winnipeg*

AND

G. A. FERGUSON, Ph.D.

*McGill University, Montreal*

IN any army a variety of conditions exist favouring the rapid spread of disease: the threshold density of susceptibles is low; individuals are drawn together from diversified sources into large communities; the camp population is in a constant state of flux; immigration and emigration occur on a large scale. Canadian Army figures show that the incidence of the common infections rarely if ever fell to zero. In every month of every year between 1940 and 1945 some cases of each disease occurred, and no Military District experienced a single year without reporting cases of all the more common communicable diseases. We may conclude that in the wartime Army population many of the more common infective micro-organisms were constantly present, and the periodic increase and decrease in prevalence resulted from propitious or unfavourable factors.

When a disease is endemic in any population, experience indicates that a density of susceptibles above the threshold is an important factor favouring the growth of infection. In the wartime Army, increase in the density of susceptibles depended largely on the rate at which non-immune individuals were recruited. Where the greater proportion of recruits was enlisted from isolated and sparsely settled areas, the threshold density in the Army community was soon reached. Where recruits were enlisted from crowded cities, rife with infection, childhood immunization high, the density of susceptibles rarely rose markedly above the threshold, and nothing of epidemic proportions developed.

Winter conditions favoured the spread of infection. Frequent change of air in Army huts became difficult. The provision of central heating and appro-

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priate ventilation systems was not possible in the majority of wartime camp installations in Canada. Since the floors in camp huts were generally of soft wood, the presence of dust in sleeping quarters and drill halls became a contributing factor in the spread of disease.

Some crowding of Army personnel in sleeping quarters was unavoidable. The Army regulation sleeping space for each soldier is 60 square feet of floor. Early in the war due to unavoidable circumstance this was reduced to 40. This crowding in sleeping accommodation is a possible further contributing factor in the spread of disease. The multiple contacts of each soldier increased the likelihood of the infection of those who were susceptible.

For such reasons the prevalence of communicable disease has always constituted a major problem in all army concentrations. Throughout history epidemics have determined the outcome of many wars. While modern medicine has succeeded in gaining substantial control over many of the more crippling diseases, malaria, typhoid, tetanus, meningitis, pneumonia, tuberculosis, and wound infections, many diseases of unknown or uncertain etiology have not yet been brought under adequate control. These include measles, German measles, mumps, chickenpox and scarlet fever. Fortunately these present no serious mortality problem. Five deaths, only, resulted from these infectious fevers in the Army in Canada during the war—four from scarlet fever and one from measles. In addition, five deaths resulted from diphtheria. A few deaths and a variety of permanent disabilities may have been caused by subsequent effects. In general, however, these diseases were important largely because of their nuisance value, since they required much hospitalization and quarantine, caused delay in training and interfered with troop movement.

Some appreciation of the magnitude of the problem with regard to chickenpox, measles, German measles, scarlet fever, and mumps may be obtained from an examination of Table I, showing the number of cases of each disease in the Canadian Army in Canada by year from 1940 to 1945, and the rates per 1,000 strength per annum.

From a study of Table I the following observations result:

- (a) During the six-year period under consideration, 41,393 cases of the five specified diseases occurred in the Canadian Army in Canada, an average of 6,900 per annum. The gross time loss for each case was approximately one month. This means that throughout the entire duration of the war an average of 575 soldiers, or roughly one battalion, was constantly off duty because of these five diseases alone. This does not include time lost by contacts.
- (b) In general the rates displayed a tendency to increase in 1941 and 1942; subsequently a progressive tendency to decline is apparent.
- (c) The most frequently occurring disease was mumps, with over 20,000 cases; the least, chickenpox, with roughly 1,300 cases.
- (d) During the six-year period approximately 750,000 different individuals passed through Army installations in Canada. Over 5 per cent of this total number were hospitalized because of one or other of the five diseases listed.

Certain aspects of each disease are considered in the paragraphs to follow.

### 1. Chickenpox

Chickenpox is one of the most volatile of all infectious diseases. For this reason it is probable that a relatively small proportion of any population in which the disease is endemic escape infection in childhood; consequently a relatively small proportion of susceptibles will be found in samples of adults drawn from such populations. The proportion of personnel in the wartime Army who were susceptible to chickenpox was in all likelihood relatively small. We should expect, in consequence, that the disease would never have attained gross epidemic proportions. Due, however, to the facility of its spread, one would expect minor epidemic periods when facilitation was at its optimum.

Table I shows the number of cases of chickenpox which occurred in the Army in Canada by month for the period January 1940 until December 1945. Table II shows the geographical incidence and correlates this with certain population factors. Data for the period January 1940 until December 1943 relate to hospital admissions; subsequent figures relate to hospital discharges.

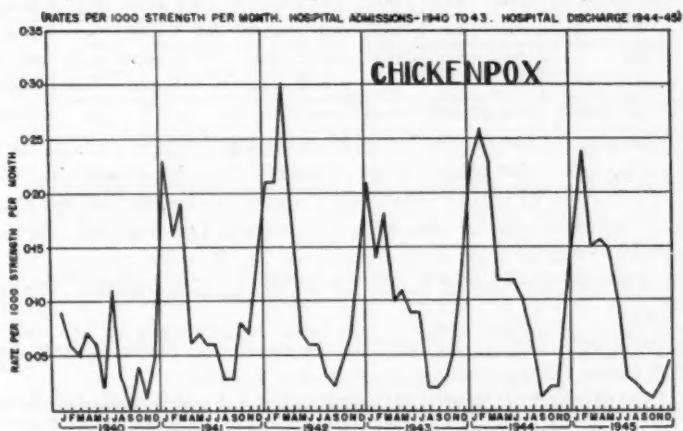


FIGURE I. Seasonal Variations in Chickenpox, Canadian Army in Canada, 1940-45

It is improbable that any cases of chickenpox escaped detection and hospitalization. Figure I represents graphically the seasonal variation in chickenpox over the period under examination.

Chickenpox displays in these data a systematic epidemiological pattern from year to year despite the low rate. Four seasonal phases may be clearly identified.

- (a) *Upswing Phase*—October, November, and December.

The incidence begins to rise in October and continues to rise during the months of November and December.

- (b) *Maximal Phase*—January, February, and March.

The peak period may occur in any of these three months.

- (c) *Declining Phase*—April, May, and June.

In each year a break in the downward trend of the disease occurs in the month of April and continues until the trend is markedly resumed in July.

(d) *Minimal Phase*—July, August, and September.

September would appear to be the most frequent minimal month.

The occurrence of a declining phase in the seasonal pattern of this disease is of substantial interest. This phenomenon persisted from year to year and may indicate some consistent epidemiological feature of this disease in northern climates.

TABLE I  
SUMMARY OF FIVE COMMUNICABLE DISEASES  
CANADIAN ARMY IN CANADA  
1940-1945 inclusive

Year	Chickenpox		Measles		German Measles		Scarlet Fever		Mumps		Total	
	No. of Cases	Rate* per 1,000 strength	No. of Cases	Rate per 1,000 strength	No. of Cases	Rate per 1,000 strength	No. of Cases	Rate per 1,000 strength	No. of Cases	Rate per 1,000 strength	No. of Cases	Rate per 1,000 strength
1940	49	.6	1638	19.7	1063	12.8	138	1.7	140	1.7	3028	36.5
1941	162	1.2	2248	16.4	1815	13.2	815	5.9	1262	9.2	6302	45.9
1942	242	1.3	1290	6.7	724	3.7	1881	9.7	7665	39.5	11802	60.9
1943	291	1.2	1852	7.6	444	1.8	2081	8.5	7626	31.3	12294	50.4
1944	325	1.5	928	4.2	701	3.2	1157	5.3	1799	8.2	3910	22.4
1945	236	1.3	288	1.6	494	2.7	193	1.1	1846	10.1	3057	16.8
Total	1305		8244		5241		6265		20338		41393	

\*All rates shown are rates per 1,000 strength per annum.

Chickenpox did not decline in incidence during the later years of the period under study, as in the other diseases studied. The hypothesis here is that because the number of cases of the disease was not great, no marked change in the overall concentration of susceptibles occurred. The seasonal rise and fall in prevalence resulted from variations in the facility for contact and causes other than appreciable change in the concentration of susceptible persons.

## 2. Measles

Tables I and II show the incidence by years and in the various districts. Figure II shows the seasonal variation in this disease.

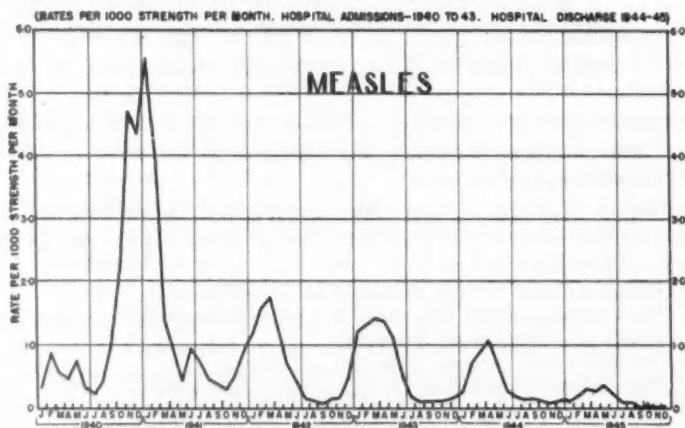


FIGURE II. Seasonal Variations in Measles, Canadian Army in Canada, 1940-45



TABLE II  
COMMUNICABLE DISEASE RATES AVERAGED OVER THE SIX-YEAR PERIOD 1940-45  
AND CERTAIN POPULATION FACTORS

Provincial Area (approx.)	Military District	Average Disease Rates per 1,000 Strength per Annum						Population Factors		
		(1) Measles	(2) German Measles	(3) Chicken-pox	(4) Mumps	(5) Scarlet Fever	(6) Total rural	(7) Per-centage of rural Enlist-ments	(8) Per-centage of rural Popula-tion	(9) Popula-tion per square mile
Ontario	1	5.59	7.46	1.28	19.04	4.88	38.25	11.05	39.94	75.51
Ontario	2	7.28	5.05	1.32	12.17	4.95	30.77	12.07	34.43	17.79
Ontario	3	7.55	5.71	.87	10.95	4.95	29.03	24.17	43.24	20.23
Quebec	4	2.21	2.53	.48	5.75	1.94	12.91	7.80	24.64	59.27
Quebec	5	4.43	4.51	.32	4.63	.57	14.46	42.30	58.78	13.90
Nova Scotia & P.E.I.	6	10.57	6.76	.91	16.95	3.98	39.17	43.23	56.63	29.35
New Brunswick	7	7.68	4.61	1.16	16.21	3.24	32.91	53.50	68.64	16.65
Manitoba & West. Ont.	10	15.88	8.60	2.29	38.74	11.07	76.67	31.80	54.06	7.89
British Columbia	Pacific Command	6.51	21.20	1.08	12.30	1.96	43.05	25.33	45.89	10.22
Saskatchewan	12	34.65	8.82	1.99	43.27	23.57	112.30	54.57	67.06	7.23
Alberta	13	25.80	6.93	2.11	42.98	15.13	92.95	39.59	61.95	6.18

1. All rates shown are rates per 1,000 strength per annum average over the six years, 1940-45.
2. The percentage of rural enlistments means the percentage of personnel enlisted from rural areas (as distinct from urban areas) in any Military District.
3. The percentage of rural population means the percentage of the total population in each military district defined as rural.

Examination of Figure II indicates that one of the outstanding features in the history of measles in the Canadian Army was the 1940-41 epidemic. In considering the development of this epidemic the following points may be observed:

- (a) The incidence began to rise sharply in August when all facilitation factors were against the progress of the disease.
- (b) The peak was sustained over a three-month period, November and December, 1940, and January, 1941. The maximum rate, 5.6 per 1,000 strength per month, occurred in January 1941.
- (c) Rates during the subsequent minimal period in the summer of 1941 were higher than rates normally recorded during those months. This was an expected residual effect.

This epidemic period unquestionably resulted from the rapid accumulation of susceptibles in the Army through heavy enlistments during the 1940-41 period. The density of susceptibles reached such a high level that the epidemic occurred without the assistance of the other facilitation factors. The highest rates were recorded in the western districts where a high proportion of the enlistments were drawn from rural farming communities.

The subsequent pattern of the disease shows pronounced seasonal variation. The maximal phase occurs usually in February, March, and April and the minimal phase in July, August, September, October, and November.

During December and January, the rates tend to be on the upswing, while during May and June the downswing occurs.

The prevalence of measles in the wartime Army in Canada showed a progressive decline following the 1940-41 epidemic. The major factor contributing to this progressive decline was probably the gradual decrease in the concentration of susceptible persons. Provided the threshold density of susceptibles displayed uniform seasonal variation from year to year (a circumstance which implies uniform variation in facility for contact from year to year and likewise no gross changes in the virulence of the micro-organism), the annual rates would be expected to become progressively lower as the proportion of immune individuals in the population tended to increase.

### 3. German Measles

Tables I and II show the yearly rates and district distribution of German measles for the period under examination. Figure III illustrates the seasonal variations in this disease.

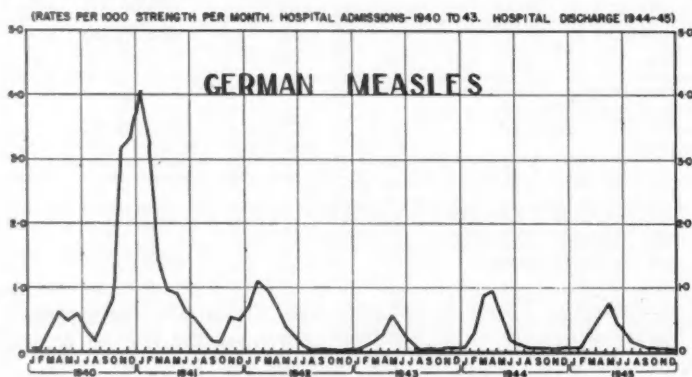


FIGURE III. Seasonal Variations in German Measles, Canadian Army in Canada, 1940-45.

The seasonal pattern of German measles is markedly similar to the corresponding pattern for measles. The 1940-41 German measles epidemic coincided with the 1940-41 measles epidemic and displayed roughly the same characteristics. It is difficult to determine to what extent confusion in diagnosis may have contributed to this similarity. As far as can be ascertained, nothing exists in the literature to suggest that these two diseases coincide in time. The correspondence may result because their course within the Army has been influenced by common epidemiological factors.

The peak German measles rate occurred in January 1941, when a rate of 4.1 per 1,000 strength was reported. The prevalence of German measles displayed a tendency to decline progressively from year to year in a manner not dissimilar from the decline noted in measles, and presumably from similar causes.

### 4. Scarlet Fever

Streptococci, if not the actual cause of scarlet fever, are intimately associated with its occurrence. Scarlet fever is, however, only one of many patho-

logical effects that may be associated with streptococci. These organisms may be rampant in a camp and cause nothing other than local respiratory effects. Their presence may at times be associated for no very obvious reason with a high rate of scarlet fever, rheumatic fever, middle ear disease, or nephritis. The differentiation of haemolytic streptococci, Group A, into more than 40 types has added little of clinical value. Apparently various strains may produce any or all of the clinical effects. The syndrome, termed scarlet fever, will depend upon whether or not the individual attacked has in his blood the erythrogenic factor which is responsible for the rash. Once having had the scarlet fever rash, the victim derives a high degree of immunity to subsequent attacks, although he may frequently suffer from other streptococcal inflammations. In addition, patients may have immunity to erythrotoxicity conferred by other streptococcal experience that does not produce scarlet fever.

Tables I and II show the yearly incidence and the district distribution of scarlet fever for the period January, 1940 to December, 1945. The seasonal

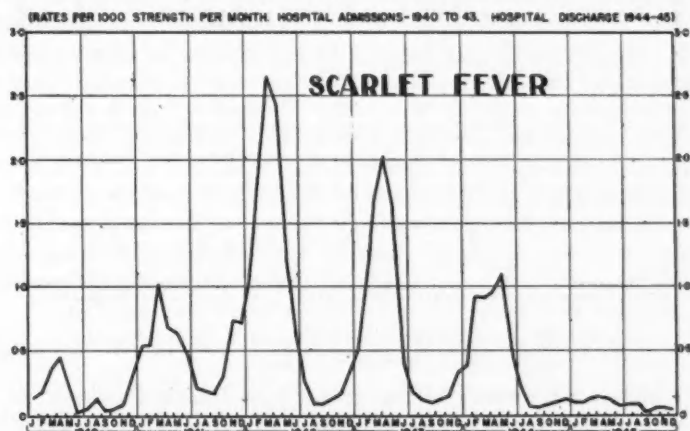


FIGURE IV. Seasonal Variations in Scarlet Fever, Canadian Army in Canada, 1940-45.

variations are illustrated in Figure IV. In contrast to measles and German measles, the peak incidence was not attained until March 1942, when a rate of 2.7 per 1,000 strength was recorded. In subsequent years the incidence gradually declined.

Examination of data on regional differences indicates that the scarlet fever rates were substantially higher among military personnel in the three Prairie Provinces than in other parts of Canada. This was probably due to the accumulation of recruits from isolated communities in which streptococcal infection was infrequent. The alternative hypothesis may, however, be advanced that the high scarlet fever rates resulted from the presence of a particularly virulent strain of streptococcus. No bacteriological investigations to prove or disprove this latter hypothesis have yet been conducted. The available data lend weight to the inference that the concentration-of-susceptibles theory provides a better explanation of the observed events. Measles and mumps also ex-

hibited high rates among military personnel in the prairie provinces. No clear reasons exist to justify the inference that the infective micro-organisms of all three diseases were particularly virulent in the prairies.

### 5. *Mumps*

Tables I and II provide data on the prevalence of mumps, and Figure V illustrates graphically the seasonal variations.

This disease was one of the leading causes of hospitalization in the wartime army in Canada, over 20,000 cases being reported in the period under investigation. The peak period occurred in March 1942 when the rate rose to 10.2 per 1,000 strength per month. As with scarlet fever, measles, and German measles, a progressive decline occurred in subsequent years.

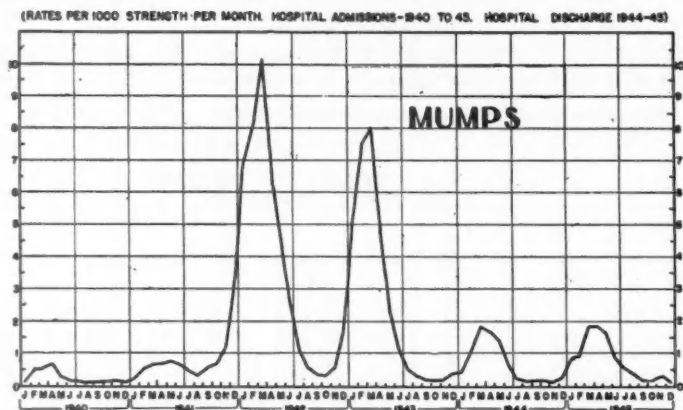


FIGURE V. Seasonal Variations in Mumps, Canadian Army in Canada, 1940-45.

The highest rates were observed in the three Prairie Provinces. In 1942 the rates per 1,000 strength per month were as follows: Manitoba (Military District 10), 97; Saskatchewan (Military District 12), 93; Alberta (Military District 13), 89. These rates indicate a very substantial loss in training time due to this one disease alone. Although minor epidemics occurred in other provinces, these were less pronounced than those occurring in the west.

### REGIONAL DIFFERENCES

Data on the regional variations in the prevalence of the five selected diseases are presented in Table II. Examination of the data indicates clearly that the diseases studied were most prevalent in the three Prairie Provinces (Military Districts 10, 12, and 13) and least prevalent in the Province of Quebec (Military Districts 4 and 5), with other provinces occupying an intermediate position. The highest combined rate, 112 per 1,000 strength per annum, was found in Saskatchewan (Military District 12) and the lowest, 13 per 1,000 strength per annum, in Southern Quebec (Military District 4).

The fact that the highest rates occurred in the three Prairie Provinces is presumably accounted for by the high proportion of rural enlistments from

those provinces, where the low population densities have reduced appreciably the facility for contact. To study these factors in greater detail the following information was gathered:

- (a) The percentage of enlistments from rural areas in each Military District.
- (b) The percentages of the total population (defined as rural) in each Military District.
- (c) The population density per square mile in each Military District, excluding those Census Divisions of counties where the population density is less than 1.0 per square mile.

The Province of Saskatchewan (Military District 12) has the highest total disease rate, 112 per 1,000 strength per annum, also the highest percentage of rural enlistments (54.57 per cent). Further, a high proportion of the population of this province live in rural areas, 67.1 per cent of the population living outside the boundaries of incorporated cities, towns, and villages. Southern Quebec (Military District 4), which includes the heavily populated Montreal area, had the lowest combined rate, the lowest percentage of rural enlistments, the most highly urbanized population, and the highest population density.

In the statistical treatment of data of the type presented here, adjusted rates would normally be calculated. Such rates would adjust for differences in the percentage of rural enlistments, and possibly for other known factors. Here, however, adjusted rates cannot be calculated, because infected persons were not classified as rural and urban. Some knowledge of the association between the disease rates and other factors may be obtained from an examination of the intercorrelations between the variables. The rank order correlations\* between all nine variables shown in Table II (disease rates and population factors) have been calculated and are shown in Table III.

TABLE III  
RANK ORDER INTERCORRELATIONS OF NINE VARIABLES  
DISEASE RATES AND POPULATION FACTORS

	1	2	3	4	5	6	7	8	9
1	-								
2	.54	-							
3	.72	.59	-						
4	.82	.74	.85	-					
5	.81	.54	.89	.86	-				
6	.82	.86	.79	.56	.77	-			
7	.66	.26	.18	.43	.24	.50	-		
8	.66	.21	.24	.46	.31	.47	.94	-	
9	-.65	-.46	-.55	-.48	-.45	-.67	-.57	-.61	-

An examination of the intercorrelations of Table III suggests the following:

- (a) The high intercorrelations between diseases (variables 1 to 6), suggest that in large measure common dynamic factors operate in determining the prevalence of these diseases.
- (b) The association between disease rates and various population factors is clearly indicated.

\*The rank order correlation coefficient is a measure of association obtained in the present case by replacing the variate values, the rates, by the ordinary numbers from 1 to 11, and applying the simple formula  $\rho = 1 - \frac{6\sum d^2}{n(n^2-1)}$  where  $\sum d^2$  is the sum of the squares of differences between ranks. The coefficient  $\rho$  takes values ranging from -1 in the case of perfect negative association to +1 in the case of perfect positive association.

- (c) These data suggest that the prevalence of measles and mumps is more dependent on population factors (or factors which are some function of population factors) than German measles, chickenpox, and scarlet fever.

The correlation approach to data of this type could be elaborated in considerable detail. We do not, however, consider the present data sufficiently comprehensive to warrant other than a crude correlation analysis. Were it possible to gather data on a much larger number of variables which might be thought to be related to the prevalence of a disease, the technique of factorial analysis would be applicable, and the factors which determine its prevalence could be identified as mathematical components. Such an approach to the study of disease might prove profitable and lead to the formulation of useful hypotheses. As far as the authors are aware, the techniques of factorial analysis, although widely used elsewhere, have never been applied in epidemiological studies.

#### CONCLUDING REMARKS

The data presented in this paper are not incompatible with existing theories on the dynamics of infection, and clearly provide supporting evidence for a number of hypotheses contained in such theories.

Firstly, the hypothesis exists that facility for contact exhibits a seasonal variation, due possibly in large measure to variations in ventilation. The incidence of the five diseases studied in this investigation varied markedly with the season of the year. In general the seasonal variations observed are appreciably more pronounced than those observed in bodies of data relating to the incidence of communicable disease in more temperate climates.

Secondly, the hypothesis exists that the prevalence of a disease varies as some function of the concentration of susceptible persons in the community. In the present data, measles and German measles reached a peak period in 1941, while scarlet fever and mumps reached a peak period in 1942. In subsequent years these four diseases exhibited a progressive decline in prevalence. Heavy enlistments occurred during the early years of the war and large numbers of susceptible persons were introduced into the Army population. Subsequently enlistments declined, the proportion of susceptibles in the Army declined, and as a result the disease rates showed a progressive tendency to decline. The difference of one year in the peak period for measles and German measles (1941) and for scarlet fever and mumps (1942) may possibly be explained partly on the grounds that the concentration of persons susceptible to these two latter diseases was built up more slowly than for the two former. The failure of chickenpox to show any progressive decline in subsequent years is thought to result because the number of cases of the disease was not great, and no great change in the concentration of susceptible persons occurred.

Thirdly, the hypothesis exists that the concentration of susceptibles in a community is related to certain population factors which influence the facility for contact. The high disease rates recorded among personnel recruited from the highly ruralized and thinly populated Prairie Provinces and the low rates recorded in the highly urbanized and thickly populated areas in the Province of Quebec are clearly compatible with this hypothesis.

It is clear from these data that the recruitment of large numbers of personnel from sparsely settled rural areas, and the concentration of such personnel in military installations, results in a situation somewhat analogous to that which might be anticipated on the introduction of infective micro-organisms into an infection-free community. Under any future large mobilization in Canada, given conditions not markedly dissimilar from those which prevailed during the last war, it may be anticipated that similar disease patterns will occur. This creates a concrete problem in military epidemiology. The solution is not obvious. A possible solution might lie in a compulsory military service which would permit the establishment of an immunity to disease in time of peace, which would result in a significant saving in time and manpower in the advent of war, when such a saving might prove a matter of vital military importance.

It should be mentioned, too, that a factor of first-rate importance in determining the amount of any disease in the Army is the prevalence of the disease in the civilian population. This necessarily should be considered in relation to the other factors discussed here.



## A Nutrition Project to Assess the Efficacy of Classroom Teaching

E. M. ESLER AND E. W. MCHENRY

*Department of Public Health Nutrition  
School of Hygiene, University of Toronto*

IN a project designed to improve health conditions in the area served by one public school, educational efforts were made to alter food consumption by classroom instruction and by education of the parents. The project was a long-term one and the area was that of the Hartman Jones Memorial School of East York Township. In a published report (1), descriptions were given of the difficulties in evaluating educational procedures, particularly when a variety of them are used simultaneously. Under such circumstances it is not possible to say whether a given procedure has caused changes. In the case of food use, the situation is made more difficult by alterations of circumstances over which no control can be exercised by the educators. Changes in prices or in availability can quickly alter the consumption of foods and give false impressions of effects due to education. For this reason it is advisable to use a control group as similar as possible to the experimental one and which will indicate those changes for which the educational procedure is not responsible. Experience in the Hartman Jones study indicated the desirability of assessing one type of educational procedure at a time and doing so under controlled conditions.

For this purpose, it was necessary to select two schools which would have the following characteristics: (1) similarity in type (urban or rural, size, similarity in teaching, and preferably under the same control); (2) sufficiently close for convenience of access and also to have about the same facilities for food purchases; (3) similarity of area populations as to economic level and race; and (4) preferably not recently exposed to extensive efforts in nutrition education. Rough appraisals indicated that these conditions could be met by two elementary schools in North York Township. These schools, Glen Park and Forest Hill, are in adjacent areas, under the same Board of Education, and under the same inspector. In general, the areas are served by one set of stores. Economic levels and race distribution appeared to be similar in the two areas. The schools are about equal in size. While one school (Glen Park) is housed in a very modern building, both have similar services. Permission for the study was given by the Board of Education and by the two principals. Neither school has a cafeteria or lunch-room since it is easily possible for most pupils, except in stormy weather, to have lunch at home. Preliminary, rough inspection indicated that nutritional conditions were similar in both schools. Glen Park School was selected as the one for experimental educational efforts. Subsequent information showed that food habits were somewhat better, initially, in this school; had this been known at the start, the choice of experimental school would have been Forest Hill.

### ESTIMATIONS OF FOOD USE

Evaluation of an educational procedure in nutrition can be made directly in terms of food use and is derived from the answer to the question, "Did the educational effort cause a change in food consumption?" Obtaining this answer may seem simple; actually it is beset with difficulties. This information can be secured only by the cooperation of the subject, and if the subject is a young child, by the assistance of parents. Food use is variable from day to day and it is advisable to determine average daily consumption for a period of at least seven days; the length of this period increases the problem of getting cooperation. A satisfactory method for obtaining reliable information of food use has not been found by us. Experience in previous studies led to the use of food record booklets. These have a page for each of seven days and the cover carries simple instructions. Subjects are urged to record food at the time of eating and not to rely on memory. Any method of obtaining data on food consumption by individuals tends to focus attention on foods and this may cause a change in food use. In this study we decided to limit the educational test and the appraisal of food use to children nine or over because of the difficulty of securing information regarding younger children. Since grade VII was the final one in the Forest Hill (control) School, the study was applied to grades V, VI, and VII in both schools. Food records were kept by pupils in these grades for one week before and also after the period of experimental education. The booklets were distributed by the teachers as an assignment in health education.

### EDUCATIONAL PROCEDURES

Health is a subject for all grades in elementary schools in Ontario and generally one period each day is assigned to it. Nutrition is part of the curriculum in health education. Teachers in Forest Hill School, which served as control, were asked not to change their health teaching from the accustomed pattern.

It was decided to limit experimental teaching to three objectives and teachers in Glen Park School were asked to emphasize these. The objectives were:

1. Consumption of at least one pint of milk each day.
2. Daily use of at least one half orange.
3. Intake of 800 units of vitamin D daily.

These objectives were discussed with the teachers and they were furnished with nutritional information regarding milk, vitamin C, and vitamin D. Posters and booklets on the three objectives were supplied. An animal-feeding experiment to show the value of milk for growth was carried out in each classroom. A movie on milk was shown. Suggestions to incorporate nutrition into the teaching of such subjects as arithmetic and English were made; for example, a composition was written by each child on the subject, "Why We Eat Oranges".

Emphasis on the three objectives was continued for six weeks. Decision as to the length of the period was arbitrary but it was felt that six weeks should be sufficient to produce some effect.

### RESULTS

The accompanying table shows the percentages of children who had satisfactory supplies of various foods. Average daily intakes were graded as satis-

factory if they equalled or exceeded the following amounts (except in the case of sweet foods) :

- Milk, one pint.
- Citrus fruit, 4 servings per week.
- Vitamin D, 800 units.
- Eggs, 3 per week.
- Fruit other than citrus, 4 servings per week.
- Potatoes, one serving.
- Vegetables other than potatoes, one serving.
- Meat, one serving.
- Bread, 3 slices.
- Cereal, one serving.
- Cheese, 3 servings per week.

Sweet foods, less than four servings weekly. It should be noted that this is the reverse of other foods, since we consider it desirable to decrease the use of sweet foods by children.

Breakfasts and lunches were graded as satisfactory or unsatisfactory. A breakfast was considered satisfactory if it contained :

- 1 serving fruit.
- 1 serving protein food (eggs, bacon, ham) or 1 serving cereal.
- 1 slice toast.
- 1 serving milk.

A lunch was graded satisfactory if it supplied four or five of the following :

- 1 serving vegetables, as such or in soup.
- 1 serving protein food (meat, eggs, cheese, beans).
- 1 slice bread.
- 1 dessert.
- 1 serving milk.

TABLE I  
PERCENTAGE OF CHILDREN HAVING SATISFACTORY FOOD INTAKES

	Glen Park School		Forest Hill School	
	October 1948	December 1948	October 1948	December 1948
Total Number in Survey	64	49	57	43
Milk.....	92	90	71	82
Citrus fruit.....	77	92	51	51
Vitamin D.....	42	63	18	28
Eggs.....	77	65	60	63
Other fruit.....	97	92	81	70
Vegetables.....	75	61	49	37
Potatoes.....	41	41	56	35
Meat.....	70	73	58	53
Bread.....	63	73	84	88
Cereals.....	59	63	49	47
Cheese.....	11	18	7	9
Sweet foods.....	16	27	15	26
Breakfasts.....	58	57	32	23
Lunches.....	50	71	37	30

### *Discussion of Results*

Changes which occurred in food use will be considered for convenience in respect of single foods or food groups. Attention will be given first to the three objectives in the experimental education.

*Milk*—In recent studies in Toronto and elsewhere in Canada inadequate use of milk was observed in about 30 per cent of children of school age. In the present project, the pupils in the control school conformed to this general situation in the first appraisal. Children in Glen Park School were found to be better than was anticipated; 92 per cent used more than one pint of milk before the period of emphasis. Little change was expected, or did occur, as the result of the educational procedure. On the other hand, there was a significant improvement in milk consumption in the control group; this may have been caused by the attention to food use resulting from the recording of food consumption.

*Citrus fruit*—A distinct improvement in the experimental school with a lack of change in the control school could be interpreted as a result of educational endeavour.

*Vitamin D*—Increases in the use of vitamin D preparations occurred to about the same extent in both groups and appear to have been due to influences other than the experimental education. One possible factor is that mothers in Toronto repeatedly state that children should be given vitamin D to prevent colds and they consequently feel that administration should begin with the onset of winter weather.

*Foods Not Emphasized*—In the experimental group the intake of fruit other than citrus, potatoes, meat and cereal remained unchanged; there was an increase in the percentage of children having satisfactory supplies of bread and of cheese. In both schools there was a marked decrease in the use of vegetables and this appears to have resulted from seasonal shortages and increased prices. A drop in the number of children having good supplies of eggs in the experimental group was not accompanied by a similar change in the other school and cannot be explained. In both groups of children there was an improvement with regard to sweet foods; i.e., a decreased use.

In the control group there was a deterioration in the quality of both breakfast and lunch. The breakfast situation in the experimental group remained unchanged but there was a real improvement in the percentage of children having satisfactory lunches.

### *Evaluation of the Educational Procedure*

Nutrition education can be considered to be effective if it causes an improvement in food use. In the present instance emphasis was placed on milk, citrus fruit, and vitamin D. A small improvement in milk consumption was possible in the experimental school but was felt to be unlikely because of the previous fairly satisfactory situation; the possible improvement did not occur. The positive change in consumption of vitamin D took place to a similar extent in both groups and appears to have been due to common causes not connected with the experimental education. In the case of one objective, citrus fruit, education appeared to have been effective. Classroom emphasis on three nutritional objectives during a

period of six weeks was partially effective for one objective but had no influence for the others.

It is interesting to consider changes in the use of foods other than those emphasized. Deterioration in the consumption of three foods occurred in the experimental group; these were eggs, fruits, and vegetables. A similar reduction in two of these (fruits and vegetables) took place in the control group, who also had a lessening in potato consumption. A total assessment of all food changes indicates that there was a general improvement in the experimental group and a worsening in the control group. This opinion is supported by deterioration in the quality of breakfasts and lunches in the control children while an improvement in lunches took place in the experimental group. Educational emphasis in the classroom may have quickened the efforts of mothers to supply better meals. We have repeatedly observed that the recording of food intakes has educational value.

The results indicate that the experimental education had an effect upon the use of foods, but not a marked one, as judged by observations at the end of the emphasis period. Later observations should be of value to determine whether there was slow, cumulative result, or whether, indeed, the observed effect was transitory. In the experimental education more teaching aids and more information were available to the teachers than is customary. It should be noted that emphasis was given to three simple objectives and the project could be criticized as being of too short duration. However, the present results clearly indicate the need for critical study of health education in classrooms, at least with respect to nutrition.

#### SUMMARY

In an attempt to evaluate classroom teaching of nutrition, food consumption of two groups of children was studied before and after an experimental period of emphasis on three objectives applied to one group. Classroom emphasis was partially effective for one objective, and ineffective for the other two, but appear to have a general effect upon food use.

Grateful acknowledgment is made to the International Health Division of the Rockefeller Foundation for the assistance afforded by a grant to the Department of Public Health Nutrition.

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## The Ontario Interdepartmental Committee for Coordination in Nutrition

### DEPARTMENTAL REPRESENTATIVES:

*Dept. of Agriculture:* MISS ANNA LEWIS, MISS ANNE LAWSON

*Department of Education:* MISS MARY CLARKE

*Dept. of Health:* DR. D. S. PUFFER AND MISS EDNA L. MOORE

*Department of Public Welfare:* MR. J. S. BAND

DR. E. W. McHENRY AND MRS. E. M. ESLER *of the Dept. of Public Health Nutrition, University of Toronto, are members of the Committee.*

LATE in August, 1948, an informal discussion on the availability of nutrition material in Ontario was held; the participants came from several Ontario government departments interested in nutrition education. During the discussion it became evident that the subject of nutrition material should be considered by four departments: Agriculture, Education, Health and Welfare. Since the discussion was informal and since no provision had been made for the formation of a committee, it was decided that the situation should be discussed with the Deputy Ministers of the various departments. Subsequently, a representative committee was constituted for the purpose of studying the present issuance, use, and value of nutrition material. This report describes the activities of the committee.

### SURVEY OF EXISTING NUTRITION MATERIAL

The first responsibility of the committee was to study the existing situation in Ontario with regard to nutrition education material published by the four departments represented, distributed by them, and that also used by staff members for information and guidance. The list of material published by the four departments was small, containing only ten items with a small amount of duplication and no contradictory information. The survey was then extended to include nutrition material from other sources used by teachers, home economists of the Department of Agriculture, public health nurses, and medical officers. It was found that over 150 separate items were reported in extensive use. The material originated from various government agencies in Canada and in the U.S.A., from private organizations, and from commercial sources. Questionnaires sent to teachers, public health nurses, medical officers and home economists of the Department of Agriculture elicited opinions regarding the usefulness of material. Those returning questionnaires were asked to list material which should be issued to fill needs not now supplied. Comments and criticisms were invited.

An examination of the questionnaires showed clearly that much of the existing material was thought to be useful, although there was little information as to whether the use of the material had any effect. The picture was one of confusion and contradiction. Teachers and nurses reported difficulties resulting

from discordant recommendations and referred repeatedly to the common example of the amount of milk recommended for children which ranged from one pint to one quart daily. The suggestions and requests for new material showed that there was a wide-spread lack of information regarding existing publications, and that there was urgent need for coordination, not only in the issuance and use of material, but also in the planning of nutrition improvement programs.

The complete list of existing material was classified in terms of types of need or use. Several classes may be cited as examples: material for the guidance of public health nurses or others in providing nutrition education for expectant mothers, material for use by mothers, posters to be placed in pre-natal clinics. This classification indicated that there were available large quantities of material for some purposes while there was a dearth for other objectives. It was found that many items of general interest were available but that very little material was in use for some specific purposes; pre-natal nutrition was one of the neglected fields.

#### CONCLUSIONS FROM THE SURVEY OF MATERIAL

An analysis of the existing situation brought to the committee the inescapable conclusion that one reason for ineffectiveness in providing nutrition education for the public is the multiplicity of uncoordinated efforts presenting contradictory information. The contradiction did not result from material issued by Ontario Government departments since they were responsible for only ten items of the total of 150 and the ten items presented uniform information.

After carefully reviewing the results of the survey, the committee set forth two conclusions:

1. The fundamental undertaking in nutrition activities is to improve food habits and nutrition conditions by education.
2. The desired improvement can be achieved more successfully by ascertaining the most urgent problems and by attacking these by coordinated, but not necessarily unified efforts. The coordination should extend to the planning of programs and to the issuance and use of educational material. The coordination would eliminate waste and duplication and would prevent contradictory information being given to the public.

#### COORDINATION OF NUTRITION EDUCATION

A report on the survey of nutrition material was prepared and transmitted to the Deputy Ministers of the the four departments. The committee requested that it should be authorized to continue as a coordinating committee with the following functions:

- a. Planning of nutrition activities.
- b. Preparation and distribution of nutrition material.
- c. Consideration of the most effective methods for the use of nutrition material.

Authorization for the continuance of the committee on the above basis has been given and plans are being considered to fulfil these functions.



As a primary step in coordination the committee has decided that the four departments of government represented, which are the only ones actively engaged in nutrition activities, will employ uniform recommendations regarding the use of food. For general purposes, "Canada's Food Rules", will be employed but the committee has transmitted to the Dominion-Provincial Nutrition Conference recommendations for changes. The proposed changes are, quantities of milk, elimination of mention of Canada Approved bread since little is available, more emphasis on eggs and cheese, and a more definite recommendation regarding vitamin D. The revised Food Rules would be sufficient for most purposes but there is need for uniform sets of recommendations for the nutrition of expectant and nursing mothers, of infants, and of pre-school children. It would be of obvious advantage to have, for example, definite and uniform recommendations which would be given to expectant mothers by public health nurses, through Women's Institutes, and in home economics training. If duplication of advice occurred, it would have the advantage of emphasis; the possibility of contradiction would be avoided.

While unfamiliar with conditions in other provinces, the committee has the opinion that the situation is not unique. There is full realization that some of the existing duplication of efforts can not be avoided; in fact, duplication may have benefits if it does not cause confusion and if it is coordinated. There is also realization that a great deal of the contradictory information now given to the public cannot be prevented. It is hoped that coordination of effort and agreement on nutrition advice will serve a useful purpose.

# Schick Test Reaction, Serum Antitoxin Titre and Resistance to Lethal Doses of Diphtheria Toxin in Guinea Pigs

L. GREENBERG AND MARION ROBLIN

*Laboratory of Hygiene*

*Department of National Health and Welfare*

*Ottawa*

**O**BSERVATIONS on the Schick test reaction, serum antitoxin titre, and the relationship to incidence of diphtheria in humans, have frequently appeared in the literature (1-8). On this continent it is generally accepted that 1/250 of a unit or more per c.c. is the amount of antitoxin associated with a Schick negative reaction and that this level usually confers immunity. There have been exceptions, however, and cases of diphtheria have been noted in Schick-negative people and in individuals who had more than 1/250 unit of diphtheria antitoxin per c.c. of serum (2, 3, 6, 7, 8).

During a study of methods for the biological assay of diphtheria toxoid (9), using guinea pigs, considerable data relating to the Schick test reaction, serum antitoxin titre, and resistance to lethal doses of diphtheria toxin became available. These data have been correlated to permit a comparison with information in the literature pertaining to comparable data for humans.

## PROCEDURE

All guinea pigs on test received one subcutaneous dose of diphtheria toxoid. The amount of toxoid varied from 1 c.c. to 1/60 c.c. but in every instance, regardless of dilution, the dose was contained in 1 c.c. Nineteen days after inoculation the guinea pigs were bled from the heart and the sera were titrated individually for diphtheria antitoxin. On the 20th day the animals were Schick-tested. On the 21st day the Schick tests were read and the guinea pigs were challenged with 13 M.L.D.'s of diphtheria toxin. Triplicate tests similar to this have been reported from Hampstead (10).

Five hundred and twenty-five guinea pigs were treated as above. Two hundred and eighty-nine were Schick-negative, 214 were Schick-positive, and 22 had doubtful Schick reactions (see Table I). Sixty (21 per cent) of the Schick-negatives, 197 (92 per cent) of the Schick-positives, and 17 (87 per cent) of the doubtful reactors had less than 1/250 units of diphtheria antitoxin per c.c. of serum.

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*Presented at the fifteenth annual Christmas meeting of the Laboratory Section, Canadian Public Health Association, held in the Hotel London, London, Ontario, December 13 and 14, 1948.*

The majority of these guinea pigs were challenged with 13 M.L.D.'s of diphtheria toxin and the results of the challenging are shown in Table II. In the Schick-negative guinea pigs, 228 (95 per cent) of those containing more than 1/500 unit of diphtheria antitoxin, and 25 (53 per cent) of those with less than 1/500 of a unit, survived the challenge dose. In the Schick-positives 13 (46 per cent) of those containing more than 1/500 of a unit and 20 (11 per cent) of those with less than 1/500 of a unit survived.

TABLE I  
THE RELATIONSHIP OF THE SCHICK TEST AND SERUM ANTITOXIN  
IN GUINEA PIGS

Schick Test	No. of Guinea Pigs	Antitoxin Titre			
		>1/125 Unit	>1/250 <1/125 Unit	>1/500 <1/250 Unit	<1/500 Unit
Negative	289	194 (67%)	35 (12%)	13 (5%)	47 (16%)
Doubtful	22	0	5 (23%)	5 (23%)	12 (64%)
Positive	214	4 (2%)	13 (6%)	11 (5%)	186 (87%)

TABLE II  
THE RELATIONSHIP OF SCHICK TEST REACTION, SERUM ANTITOXIN, AND RESISTANCE  
TO LETHAL TOXIN DOSES IN GUINEA PIGS

Schick Test	Antitoxin Units	No. of Guinea Pigs	Results of Challenging with 13 M.L.D. Diphtheria Toxin	
			Survived	Killed
Negative	>1/500	240	228 (95%)	12 (5%)
Negative	<1/500	47	25 (53%)	22 (47%)
Positive	>1/500	28	13 (46%)	15 (54%)
Positive	<1/500	186	20 (11%)	166 (89%)

TABLE III  
THE RELATIONSHIP OF THE SCHICK TEST REACTION, AND RESISTANCE  
TO LETHAL TOXIN DOSES IN GUINEA PIGS

Schick Test	No. of Guinea Pigs	Results of Challenging with 13 M.L.D. diphtheria toxin	
		Survived	Killed
Negative.....	958	887 (93%)	71 (7%)
Doubtful.....	48	37 (77%)	11 (23%)
Positive.....	1024	265 (26%)	759 (74%)

Information was also obtained on a group of 2,030 guinea pigs treated as previously described except that blood samples were not taken on the nineteenth day. In this group 958 were Schick-negative, 1,224 were Schick-positive, and 48 had doubtful Schick reactions. When challenged with 13 M.L.D.'s of diphtheria toxin, 887 (93 per cent) of the Schick-negatives, 265 (26 per cent) of the Schick-positives, and 37 (77 per cent) of the guinea pigs with doubtful Schick reactions, survived the challenge dose.

## DISCUSSION

Figures have been presented showing the correlation between the Schick test reaction, serum antitoxin titre and resistance to lethal doses of diphtheria toxin in guinea pigs. From the data presented there seems little doubt that the reaction in the guinea pig is very similar to that in the human. In humans it has been estimated that roughly 92 per cent of Schick-negative people are protected (3), and in this series 88 per cent (Table II) and 93 per cent (Table III) respectively in two separate groups of Schick-negative guinea pigs were able to withstand a challenging dose of diphtheria toxin. In humans the antitoxin level associated with a Schick-negative reaction is generally believed to be 1/250 unit, and in this study 79 per cent of the Schick-negative guinea pigs had more than this amount, whereas only 8 per cent of the Schick-positives reached this level. Thus in the guinea pig, as in the human, 1/250 of a unit appears to be the unitage above which a negative reaction and below which a positive reaction can be expected.

## SUMMARY

The Schick test reaction, serum antitoxin titre, and resistance to lethal doses of diphtheria toxin in toxoided guinea pigs, was studied and the data compared to information in the literature pertaining to comparable data for humans. It was found that the reaction to diphtheria toxoid in the guinea pig is very similar to that in the human.

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# A Case of *Dipylidium Caninum* in a Child

E. KUITUNEN-EKBAUM, Ph.D.

*School of Hygiene  
University of Toronto*

PRIOR to 1938 there were so many species of *Dipylidium* described that it was almost impossible to identify any specimen of *Dipylidium* as a definite species.

Venard<sup>1</sup> made a thorough investigation of the morphology, specific variations, and life cycle of *D. caninum* and found that most of the species ascribed to the genus are identical and should be placed into synonymy. *D. caninum*, therefore, is at present the only valid species of the genus *Dipylidium* known for this continent.

*D. caninum* (Linneus, 1758) is a common and widely distributed tapeworm in dogs, cats, and their wild relatives. According to Venard, more than 50 per cent of the dogs in the United States are infected with *D. caninum*, infections ranging up to more than a thousand tapeworms in a single host.

The occurrence of *D. caninum* in human beings has been reported in different countries. Most of these cases are from children, and some have been reported in infants as young as 6 months. Cases from adults have also been reported by various authors.

Single segments or clusters of ova are discharged in the faeces. The larval or cysticercoid stage of the parasite develops in the dog flea *Ctenocephalides canis*, the cat flea *C. felis*, the dog louse *Trichodectes canis*, and the human flea *Pulex irritans*. The flea larvae, which feed on organic matter, ingest the ova of the parasite. The larvae or oncospheres emerge from the egg shell, and penetrate the intestinal epithelium into the body cavity of the flea larvae. Venard found that the oncospheres grow very little in the flea larvae and are transformed into the cysticercoid stage after the adult flea begins to feed on a suitable host. One flea may harbour one or a few *Dipylidium* larvae, or as many as forty or fifty. Cysticercoids become infective for the definitive host after developing about eighteen days in the adult flea, or about thirty days after the flea larvae ingested the ova. The time of development depends on food, temperature and humidity; it may vary from twenty-two to forty-eight days.

Larval fleas are of no danger as a source of infection. It has been suggested by some authors that babies in particular may become infected when crawling on the floor, by accidentally ingesting the flea larvae.

Dogs and cats become infected by swallowing the infected adult fleas. The human infection must occur in a similar manner by swallowing the infected fleas accidentally or by the transmission of the cysticercoids, present on the lips

<sup>1</sup>Venard, C. E.: On cestodes from dogs. Ann. N.Y. Acad. Sci., 1938, 37: 273.

or tongue of the dog. Close association with the dogs, and particularly the habit of children of allowing the dogs to lick their faces, can easily bring about the transmission of the cysticercoids from the dog to human beings.

Severe symptoms in dogs may occur when a large number of parasites is present. In most cases the human infections are slight, and the symptoms may consist of slight intestinal disturbances, loss of appetite, or nervous manifestations.

Diagnosis depends upon the finding of double-pored proglottids or egg capsules in the stools. Treatment is the same as that for other tapeworm infections.

The present case was under the care of Dr. Patricia Wanning, who submitted a proglottid that had been expelled by a three-year-old child, an out-patient at the Hospital for Sick Children. According to the information obtained, the child frequently passed one or two proglottids in her stool. A history was given that the child was nervous and had frequent diarrhoea, gastro-intestinal disturbance, and nocturnal restlessness.

This case report is published to draw attention to the fact that human *D. caninum* infection has been encountered in Canada. The infection should be kept in mind in the differential diagnosis of children presenting the above symptom complex.

The author wishes to thank Dr. Alan Brown, Physician-in-chief at the Hospital for Sick Children, for permission to publish this report.

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## HOTEL RESERVATIONS FOR THE 37th ANNUAL MEETING

HALIFAX, JUNE 28-30, 1949

(Executive Council June 27)

Early reservations are essential, as hotel accommodation is at a premium. Requests for reservations must be made through the chairman of the Committee on Reservations, Dr. D. J. Mackenzie, Public Health Laboratory, Morris Street, Halifax. The coupon on page 13 is for your convenience.

	Single Rooms	Double Rooms	Triple Rooms
Nova Scotian	—	\$9.00	\$10.50
Lord Nelson	\$5.00	8.00	10.50
Carleton	—	6.50	8.50

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# Report of the Committee on Nomenclature and Nosology, Vital Statistics Section, Canadian Public Health Association

J. WYLLIE, M.A., M.D., B.Sc., D.P.H.

*Professor of Preventive Medicine*

*Queen's University*

*Kingston, Ontario*

This report is the third in a series on the activities of the United States Committee on Joint Causes of Death of the International Conference for the Revision of the International List of Causes of Death. It covers the work of the Expert Committee of the World Health Organization for the preparation of the Sixth Decennial Revision of the International Lists of Diseases and Causes of Death, and the Sixth Decennial Revision Conference convened in Paris by the Government of France, April 26 to 30, 1948.

**I. Introduction.** Two reports on the activities of the United States Subcommittee on Joint Causes of Death of the International Conference for the Revision of the International List of Causes of Death, have been presented to the Vital Statistics Section of the Canadian Public Health Association; namely, the Interim Report at the Toronto meeting on May 6, 1946, and the Second Report at the Quebec meeting on May 21, 1947. At the latter meeting, the Committee on Nomenclature and Nosology (an amalgamation of the Subcommittee on Revision of the International List of Causes of Death and the Committee on Morbidity Classification and Statistics) was authorized to study the List of Categories of the International Statistical Classification of Diseases, Injuries and Causes of Death (Document WHO.IC/MS/1) which had been transmitted to the Government of Canada by the Executive Secretary of the Interim Commission of the World Health Organization in April, 1947.

The first meeting of the Committee on Nomenclature and Nosology was held at the Dominion Bureau of Statistics, Ottawa, on July 18, 1947, when a discussion took place on the basic principles underlying the proposed list as the medium for international classification of morbidity and mortality. A draft of the Canadian submission, embodying the recommendations endorsed by the Committee, was prepared with special reference to:

- (a) The publication of the proposed classification in three parts; namely, Part I—Introduction and List of Categories; Part II—Tabular List of Inclusion Terms, and Part III—An Alphabetical Index.
- (b) The problem of Joint Cause selection (i.e., the selection, for the purpose of statistical tabulation, of the principal cause of death when two or more causes are stated on the medical certificate of death).

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*Presented before the Vital Statistics Section of the Canadian Public Health Association at a meeting held in Ottawa, October 18, 1948.*



- (c) The publication of international manuals; and
- (d) The preparation of an Alphabetical Index to Part II.

This draft was submitted to the Technical Medical Advisory Committee on Vital Statistics to the Dominion Statistician for approval, with the recommendation that it be forwarded as the official submission of the Government of Canada to the Interim Commission of the World Health Organization. Questions submitted by the members of the Committee on Nomenclature and Nosology of the C.P.H.A. concerning the arrangement of individual categories in the List were considered. A report of this meeting, together with a copy of the Canadian submission as approved, was sent to all members on August 5, 1947, by Mr. H. G. Page, Secretary of the Vital Statistics Section, with a covering letter inviting their comments and suggestions.

A number of critical suggestions were received from Lt.-Col. E. H. Ainslie of the Department of National Defence of the Army and Air Force; Dr. G. A. Winfield of the Department of Veterans Affairs; Dr. E. A. Couture of the Division of Child and Maternal Health in the Department of National Health and Welfare, and from individual members of the Committee including Doctors N. E. McKinnon, A. H. Sellers and M. Bowman. These suggestions were coordinated in a brief which was prepared by its Canadian representative, Dr. John Wyllie, for submission to the Expert Committee scheduled to meet for a Second Session in Geneva from October 21 - 28, 1947.

At the Geneva session a detailed study of the categories of the International Statistical Classification was made, and the suggestions and recommendations of all countries were incorporated wherever possible. The lists of selected categories for certain tabulations of mortality and morbidity data also were reviewed and revised. A standard form of international medical certificate of the cause of death was recommended and the associated problems were discussed.

An outline of the progress made in these studies at (a) the Second Session of the Expert Committee, (b) the Decennial Revision Conference, and (c) the Third Session of the Expert Committee, may now be given.

## **2. Development and Present Status of the International Statistical Classification of Diseases, Injuries and Causes of Death**

### **(1) *Activities of Second Session of the Expert Committee, Geneva***

The second session of the Expert Committee for the Preparation of the Sixth Decennial Revision of the International Lists of Diseases and Causes of Death was held at Geneva from October 21 - 28, 1947, and the work begun at the first session in Ottawa during March 10 - 21, 1947, was continued. After the Ottawa Session the proposed International Statistical Classification of Diseases, Injuries and Causes of Death was issued in two volumes; namely,

Part I—Introduction and List of Categories (Document WHO.IC/MS/1), and

Part II—Tabular List of Inclusions (Document WHO.IC/MS/7).

Copies of Part I were forwarded, for review and study, to the Governments of 72 countries and to various national agencies, such as national health

administrations, central statistical offices, and social and sickness insurance agencies. Approximately 3,000 copies, including French and Spanish versions, were distributed—a task rendered possible by the efficient co-operation of the Dominion Bureau of Statistics, Ottawa. Part II was sent to agencies and individuals concerned with its further revision, and to the Governments of the United States and Canada to enable an Alphabetical Index of Inclusion Terms to be prepared by a Technical Subcommittee.

In the first edition of Part I, a list of 100 two-digit categories was inserted as a preface to the list of three-digit categories. It was compiled by giving a two-digit number to each title appearing in the sections and giving them significance for national tabulations.

Some of the categories designated by three figures are subdivided by the addition of a fourth figure,<sup>1</sup> but the main emphasis is on the list of three-digit categories, recommended for obligatory use in classifying morbidity and mortality data. The fourth-digit subdivisions are for optional use by countries and agencies interested in greater detail.

At the commencement of the second session, the need for a simple classification acceptable to small as well as to large countries was stressed by Dr. H. L. Dunn.<sup>2</sup> It was the general opinion that the Expert Committee had made too many fourth-digit subdivisions in its zeal for an encyclopaedic list of three-digit categories, that the list of one hundred two-digit categories had now no significance, and that by revising the fourth-digit subdivisions an acceptable list of three-digit categories could be compiled. For international tabulations a three-digit classification is adequate, although for national and hospital tabulations a fourth-digit subdivision may be necessary. It is expedient, however, to retain certain fourth-digit subdivisions to preserve some degree of comparability with previous International Lists.

After considerable discussion the Expert Committee decided to concentrate its efforts in producing a list which would place the main emphasis on three-digit categories as being obligatory for classifying morbidity and mortality data. It was decided, also, to assign to Part II all fourth-digit subdivisions, together with the notes appearing either as footnotes or directly under the sections and titles, and to recommend the four-digit list for optional use by countries interested in greater detail. It was further decided to recommend the publication, in one volume, of Part I—Introduction and List of Categories, and Part II—Tabular List of Inclusions, showing the list of terms under each three-digit category and fourth-digit subdivision, and in a separate volume, Part III, the Alphabetical Index.

In deciding the categories to be included in the list, the Expert Committee

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<sup>1</sup>For example, Category O45 Bacillary dysentery is subdivided into:

O45.0 Flexner-Boyd group

O45.1 Schmitz

O45.2 Shiga

O45.3 Sonne

O45.4 Bacillary, other and unspecified

<sup>2</sup>Director, National Office of Vital Statistics, Washington, D.C.; Secretary for Mortality Code, U.S. Committee on Joint Causes of Death.

sought to follow three guiding principles; namely, (i) the preservation of comparability with previous lists, (ii) the selection of diseases possessing definite social, public health and clinical interest, and (iii) the inclusion of disease entities of frequent occurrence.

The Introduction and List of Categories (Part I) was distributed to 72 countries, and replies in the form of comments, criticisms and suggestions were received from 36. These submissions were concerned with the general structure and use of the list as a combined morbidity-mortality classification, and also with amendments to the individual categories. The internal arrangement of the sections and categories in the classification received favourable comment on the whole. The opinion of the majority was in favour of the combined classification, only two countries disagreeing.

An extensive report from Sweden, comparing the proposed International Classification with the Swedish Classification of Diseases and Causes of Death, prepared in 1945, noted good agreement in several sections, and considered the grouping of accidents, poisonings and violence in two parallel classifications as a valuable innovation.

Several countries expressed concern over maintaining comparability with previous International lists. The chief criticisms were directed against the content of Section I on account of its heterogeneity, and of Section V because of the variety of diagnostic terms for mental diseases; against the transfer of leukaemia to Neoplasms (Section II), of influenza to Diseases of the Respiratory System (Section VIII), and of rheumatic fever to Diseases of the Circulatory System (Section VII).

The Expert Committee gave careful consideration to the proposed amendments and, where practicable, incorporated them in the list. Helpful suggestions were received from Dr. J. B. McDougall, Secretary of the Expert Committee on Tuberculosis of the World Health Organization, on the classification of tuberculosis; from the Institut National d'Hygiène of France with reference to the classification of neoplasms, and from the United States Committee on Joint Causes of Death with regard to the classification, by external cause, of accidents, poisonings and violence.

The United States members of the Committee reported that severe criticism had been made of the classification of accidents, and of late effects of diseases and injuries. The grouping of "accidents while at work (occupational)" and "accidents (non-occupational)" rendered necessary the duplication of almost all the categories available for classifying accidents by external cause. The separation of occupational from non-occupational accidents could, in their opinion, be made by interested agencies by the use of a fourth-digit subdivision, although its usefulness depends largely on data regarding the population at risk. Similar criticism was put forward by Switzerland.

With regard to the late effects of diseases and injuries, these may be characterized either by classifying the morbid conditions according to the *original causative disease or injury*, or according to the *present disability* requiring treatment or medical care. In the introduction to the List of Categories (p. xiii) it is stated that this procedure could not be adhered to in all sections of the

list, and that it may be necessary to resort to other secondary coding when the etiology of *all* conditions regarded as late effects of some particular disease or injury is desired. Further, since alternative methods for coding late effects may lead to confusion and lack of comparability in the compiled statistics, the supplementary Y classification (Y50 - Y88) should be used to indicate the etiology of impairments or residual conditions of prior disease or injury, so that all categories specifying late effects of diseases or injuries could be deleted from the detailed list of categories.

The Expert Committee, after thoughtful examination of the arguments advanced by the United States members, decided to redraft the classification of accidents by external cause, discarding the occupational and non-occupational grouping. This necessitated a revision of this section of the "E" code, shown in the revised List of Categories as Section E XVII (Document WHO. IC/MS/1.Rev.1). With regard to late effects the Expert Committee recognized that there are two viewpoints, one concerned with estimating the total result, eventual as well as immediate, of certain infectious diseases; the other with obtaining information on present conditions requiring treatment or medical care. It was decided to follow the practice of the Fifth Revision of the International List of Causes of Death; namely, to classify diseases as disabilities, described as late effects or sequelae, in close proximity to the original causative condition<sup>3</sup> and not primarily to the disease or disability, although in certain cases these may be shown as a fourth-digit subdivision. In the Supplementary Classification for impairments, numbers Y50 - Y79 enable both the *nature* of the disability and the *causative factor* to be classified.

Submissions from Norway, Switzerland, the United Kingdom and the United States of America, with particular reference to Section V—Mental, psychoneurotic and personality disorders, were considered in detail and, although complete agreement was not attained, a satisfactory compromise was made. Dr. S. T. Bok<sup>4</sup> proposed a re-arrangement for Diseases of the Nervous System (Nos. 330 - 369 in Section VI); this section was revised and, in accordance with his proposals, adopted by the Expert Committee. The Canadian List of comments comprising 29 items was submitted as document<sup>5</sup> WHO.IC/MS/15A, to which favourable consideration was given, most of the recommendations being accepted for insertion in Parts I and II of the International Statistical Classification.

(II) *Action taken at the International Conference for the Sixth Decennial Revision of the International Lists of Diseases and Causes of Death*

The Decennial Revision Conference held in Paris on April 26 - 30, 1948, may be considered unique in this history of international conferences from two

<sup>3</sup>For example: Category 080 Acute poliomyelitis

Category 081 Late effects of acute poliomyelitis

<sup>4</sup>Member of Expert Committee, representing Netherlands.

<sup>5</sup>A copy of this document showing the detailed items submitted for the consideration of the Expert Committee, and the decision reached may be obtained from Mr. J. T. Marshall, Dominion Bureau of Statistics, Ottawa.

standpoints: first, in securing adoption of the International Statistical Classification of Diseases, Injuries and Causes of Death by all 29 countries present; and secondly, in marking, in all probability, the last occasion of its kind, since the new machinery of the World Health Assembly will enable amendments to be made quickly without the intervening lapse of a ten-year period.

A strong plea for international adoption of Part I—Introduction and List of Categories of the International Statistical Classification, was put forward at the commencement of the Conference in plenary session by Dr. Y. M. Biraud.<sup>6</sup> He traced the development of this document (WHO.IC/MS/1.Rev.1) from its inception in the work of the United States Committee on Joint Causes of Death (of which Prof. L. J. Reed, Vice-President of Johns Hopkins University, was chairman), its acceptance by the Expert Committee appointed by the Interim Commission of the World Health Organization at the Ottawa Session in March, 1947, and its adoption by the World Health Organization as a basis for the Preparation of the Sixth Decennial Revision of the International Lists of Diseases, Injuries and Causes of Death. He mentioned that the distribution of the document to the official agencies of all countries inviting critical examination had resulted in the submission of recommendations to the Expert Committee, so that the present edition constituted an unbiased attempt to incorporate the suggestions received. He also pointed out that the present Conference differed from previous International Revision Conferences, in that the objections submitted had already been carefully weighed and, therefore, enabled the Conference to avoid discussion of details of the classification. Any further suggestions would be considered at the third session of the Expert Committee in Geneva, during May 1948.

Dr. Biraud's statement was supported by Dr. Percy Stocks<sup>7</sup> who, in presenting the List of Categories to the Conference, on behalf of the Expert Committee, advanced seven reasons for international adoption, viz.:

- (a) The List of Categories, the preparation of which involved a tremendous amount of time and energy, had been subjected already to exhaustive examination by various countries and agencies.
- (b) The distribution of copies of the List to various governments had been made and experimental trials in morbidity classification had been conducted in the United States and in Canada<sup>8</sup> with satisfactory results.
- (c) An urgent need had been expressed for the new List by several countries engaged in compiling morbidity as well as mortality statistics.
- (d) The time-interval between the close of the International Conference, followed by the third session of the Expert Committee in Geneva, and the meeting of the World Health Assembly in June 1948, where this document would be presented, was very short.

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<sup>6</sup>Director of the Division of Epidemiology and Public Health Statistics of WHO.

<sup>7</sup>Chairman of Expert Committee; Chief Statistician (Medical), General Register Office, Somerset House, London.

<sup>8</sup>Treatment Services Bulletin, Dept. of Veterans Affairs, Ottawa. Vol. III. No. 2, pp. 39 - 55 and No. 4, p. 47 - 65, 1948.

- (e) The new machinery of the World Health Assembly<sup>9</sup> will expedite action on future amendments to the List without postponement to a decennial revision conference.
- (f) Editorial changes in the final edition of the List might be safely entrusted to the Expert Committee, and
- (g) Mutual sacrifices had been made by discarding morbidity classifications<sup>10</sup> prepared for use in Canada, Great Britain and the United States, in order to produce a document which would be generally acceptable to all countries.

A concise summary of the changes in each section of the new List, in comparison with the former List of the Fifth Revision, was then made by Dr. A. H. T. Robb-Smith.<sup>11</sup> He pointed out the deciding factors in making the changes coincident with the desire to preserve comparability so far as possible, and replied to the questions asked by the different delegates to the Conference. At the conclusion of this résumé a vote was taken on the motion for adoption of the List: 12 countries accepted the List without reservation, and 7 countries accepted with minor reservations.

The general acceptance of the List was regarded as a great triumph at the close of the first day's proceedings and constitutes a landmark in the history of international conferences.

During the following days of the Conference, discussions took place concerning a variety of topics, e.g., (a) the international form of medical certificate of cause of death; (b) rules for selecting the underlying cause of death when multiple causes are mentioned; (c) lists of selected causes for special purposes in the tabulation of morbidity and mortality statistics; (d) a list of Latin equivalents of diseases appearing in the Tabular List of Inclusions for use in countries where Latin terms are used; (e) age-groups in the tabulation of vital data; (f) the diversity of definitions of stillbirth and the statistical repercussions; (g) the preparation of a selected list for the study of foeto-infantile morbidity and mortality; (h) methods of international cooperation in health statistics and vital statistics, and (i) recommendations to the World Health Assembly.

At the close of the Conference the following Convention was signed by the delegates:

*Convention of April 30, 1948.*

"The delegates, considering Article 2(s) of the Constitution of the World Health Organization, entrusting the Organization, as one of its functions, with the task of establishing and revising the necessary international nomenclature of diseases and causes of death, and Article 21(b) of the Constitution, giving the World Health Assembly authority to adopt regulations in respect of such nomenclatures, submit to the World Health Assembly, for consideration and action, the International Statistical Classification of Diseases,

<sup>9</sup>Under the Constitution of WHO, article 2(s) states that revision of the List is a function of the Organization and article 21(b) authorizes the World Health Assembly to adopt regulations concerning it.

<sup>10</sup>Manual for Coding Causes of Illness according to a Diagnosis Code for tabulating Morbidity Statistics. Misc. Pub. No. 32. U.S. Government Printing Office, 1944. Canadian Morbidity Code and Index, Appendix to Bulletin of British Columbia Board of Health, 1937, Vol. 7, No. 1. Provisional Classification of Diseases and Injuries for use in compiling Morbidity Statistics, Med. Research Council, Sp. Rep. Series. No. 248, 1944.

<sup>11</sup>Member of Index Sub-Committee of Expert Committee of WHO.



Injuries and Causes of Death and accompanying recommendations, destined to improve international uniformity and comparability of statistics of morbidity and mortality.

"The delegates undertake to recommend to their respective Governments the adoption of the above Classification and recommendations.

"The countries which have not participated in the Conference nor signed the present Convention may adhere to the latter at their request."

The delegates of 29 countries signed this Convention. The Canadian delegates were Dr. F. S. Burke, Mr. J. T. Marshall, Dr. J. A. Melanson, Miss W. O'Brien and Dr. J. Wyllie.

### *(III) Activities at the Third Session of the Expert Committee*

The proposals submitted by the various delegates to the International Revision Conference with reference to the List of three-digit categories of the International Classification (Document WHO.IC/MS/1 Rev.1), and to the List of fourth-digit subdivisions in the Tabular List of Inclusions (Document WHO.IC/MS/7 Rev.1), were reviewed. After making corrections and insertions, final versions were prepared.

In Part I,<sup>12</sup> Sections I to XVI, inclusive, contain 611 categories; Section E XVII has 153 categories for classifying injuries according to external cause, and Section N XVII has 189 categories when they are classified according to nature of injury. For certain supplementary classifications 88 categories are appended.

Part II—Tabular List of Inclusions, contains most of the diagnostic terms which occur fairly frequently in morbidity and mortality reporting. Obsolete and unsatisfactory terms and infrequent diagnoses, which may still appear in medical records, have been relegated to the alphabetical index.

<sup>12</sup>The Sections are:

- I. Infective and Parasitic Diseases (No. 000-138).
- II. Neoplasms (No. 140-239).
- III. Allergic, Endocrine System, Metabolism and Nutrition Diseases (No. 240-289).
- IV. Diseases of the Blood and Blood-forming Organs (No. 290-299).
- V. Mental, Psychoneurotic and Personality Disorders (No. 300-326).
- VI. Diseases of the Nervous System and Sense Organs (No. 330-398).
- VII. Diseases of the Circulatory System (No. 400-468).
- VIII. Diseases of the Respiratory System (No. 470-527).
- IX. Diseases of the Digestive System (No. 530-587).
- X. Diseases of the Genito-Urinary System (No. 590-637).
- XI. Deliveries and the Complications of Pregnancy, Childbirth and the Puerperium (No. 640-689).
- XII. Diseases of the Skin and Cellular Tissue (No. 690-716).
- XIII. Diseases of the Bones and Organs of Movement (No. 720-749).
- XIV. Congenital Malformations (No. 750-759).
- XV. Certain Diseases of Early Infancy (No. 760-776).
- XVI. Symptoms, Senility and Ill-defined Conditions (No. 780-795).
- XVII. Accidents, Poisonings and Violence (E800-E999, N800-N999).

A dual system of classification has been adopted for this section, the first based on the external cause of the injury, the second on the nature of the injury.

In addition, two supplementary classifications are available; one for Special Admissions, Livebirths and Stillbirths; the other for Prophylactic Inoculations, Impairments, Blindness and Deafness.



The preparation of Part III, an Alphabetical Index of all terms appearing in the Tabular List of Inclusions, was entrusted to a subcommittee at the conclusion of the first session of the Expert Committee in Ottawa, March 11 - 21, 1947. This extremely tedious work was done in cooperation with the Dominion Bureau of Statistics, the United States Navy Department, the United States Public Health Service, the United States Veterans' Administration, and the United States War Department. These agencies extended generous help in technical advice and clerical assistance. In spite of the distances between their countries, the American, British and Canadian members of the subcommittee cooperated valiantly in exchanging factual information and in arranging meetings for discussion of indexing problems. The complete index also includes all the terms in the Diagnostic Code of the United States Public Health Service (Misc. Pub. No. 32), the Nomenclature of the Royal College of Physicians of London (7th edition), and the Standard Nomenclature of Disease of the American Medical Association (1942 edition). The arrangement of all the index terms in alphabetical sequence, the insertion of new terms in the Tabular List resulting from decisions taken at the second session of the Expert Committee and at the International Decennial Conference, and the verification of code numbers assigned to the terms have involved a prodigious amount of time and energy.

### **3. Development of Abridged (Special) Lists for Tabulation of Morbidity and Mortality Data**

At the Ottawa (1947) session, two abridged (special) lists for the tabulation of morbidity and mortality data were presented without discussion. Before considering these tentative lists at the second session (Geneva, 1947), the Expert Committee discussed the uses to be made of the List of three-digit categories (now designated the Detailed List) and of the Abridged Lists, in compiling morbidity and mortality statistics. It was decided that the Detailed List of three-digit categories should be used in the coding of all morbidity and mortality data from the year 1950 onwards, and also for the tabulation of mortality data by sex for the country as a whole.

Three short lists were approved:

- (a) An Intermediate List of 150 Causes for Tabulation of Morbidity and Mortality.
- (b) An Abbreviated List of 50 Causes for Tabulation of Mortality.
- (c) A Special List of 50 Causes for Tabulation of Morbidity for Social Security Purposes.<sup>18</sup>

After a statement by Dr. Feraud of the International Labour office, it was suggested that the I.L.O. conduct preliminary trials with this short list. It was agreed that the list be considered at the International Decennial Conference, in April, 1948.

The delegates to the International Decennial Conference adopted the three short lists and in Resolution No. 5 made recommendations with regard to tabu-

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<sup>18</sup>Submitted by the Inter-American Committee on Social Security.

lations by age-groups and by sex, and for tabulating statistics of infant mortality.<sup>14</sup>

At the third session (Geneva, 1948) the Expert Committee decided to request countries to indicate, in parentheses, before or after the groups and categories in the short lists, the corresponding numbers of the detailed list.

#### 4. Evolution of the International Form of Medical Certificate of Death

At the second session of the Expert Committee in Geneva in October, 1947, the section of the Canadian submission relating to the Problem of Joint Cause Selection was presented as Document WHO.IC/MS/16. The recommendations urged the international adoption of:

- (1) A uniform medical certificate as part of the death registration form in conformity with that recommended by the Health Section of the League of Nations in 1925, with such modifications as are warranted by practical experience.
- (2) A uniform system of selecting the underlying cause of death as the main cause for statistical tabulation based on formulated rules.

Similar conclusions were expressed in a Preliminary Report of the United States Committee on Joint Causes of Death (Document WHO.IC/MS/11) presented by Dr. H. L. Dunn. This Committee had conducted an investigation into one phase of the joint cause problem by studying microfilm copies of 10,000 death certificates from two states, New York and Maryland.

Causes of death were assigned in three ways:

- (a) By the joint cause procedure presently employed in the National Office of Vital Statistics, Washington, D.C.; namely, applying the joint-cause rules in the Manual of Joint Causes of Death<sup>15</sup> to all causes reported on the certificate.
- (b) By the method of selection used in the English Registrar-General's Office, London.
- (c) By a modified procedure in which the joint-cause rules are applied only to the causes mentioned in Part I of the certificate.

In addition, the immediate cause of death and all other causes of death jointly reported on the certificates were coded. The results of this study showed:

- (1) That the preferred cause of death selected by the current United States procedure agreed with the underlying cause of death assigned by the English method in 83 per cent of the certificates; the agreement rising to 92 per cent when the modified United States procedure was applied.
- (2) The importance of proper medical certification, since approximately 25 per cent of the medical certificates were incorrectly filled in where two or more causes of death appeared.

These defects were ascribed to the lack of:

- (a) Specific instructions on the standard form of death certificate for the guidance of physicians.
- (b) A systematic program to promote more intelligent appreciation in the use of the form of medical certificate of death.
- (c) Appreciation of the value of correct certification.

Another phase of inquiry involved the different forms of death certificate

<sup>14</sup>See Articles 6 and 8 WHO. Regulations No. 1.

<sup>15</sup>Fourth edition, 1939. Superintendent of Documents, Washington, D.C., U.S.A.

and the joint-cause-selection rules used by various countries. The design of the forms followed one of three principles:

- (1) That recommended by the Health Section of the League of Nations in 1925 of stating in Part I of the certificate the immediate cause of death first, then the cause or causes related to the immediate cause in reverse order of relationship or in time sequence, and inserting in Part II any other important morbid conditions contributory to death but without relation to the immediate cause.
- (2) The principle in which the physician selects the causes to be reported as primary (first, main, principal) and contributory (second, secondary, antecedent) causes of death.
- (3) The principle wherein the physician reports a single cause to be tabulated.

The selection of the main cause of death, when more than one cause appears on the medical certificate, is performed in different ways; some countries possessing rigid, others general rules. At least seven countries employed the United States Manual of Joint Causes of Death.

The United States Committee realized that the new International Statistical Classification of Diseases, Injuries and Causes of Death rendered a revision of the Manual extremely complicated, due to the expanded classification, and was not prepared to undertake it. The solution of the joint-cause problem involved:

- (1) The adoption of a suitable form of medical certificate designed to elicit the necessary information of the underlying cause of death.
- (2) A program of instruction in the principles of medical certification of death.
- (3) The formulation of rules for the selection of the main cause of death.

In order to ensure international comparability in mortality statistics, it was decided that the English procedure, of placing the onus on the certifying medical practitioner for the order of statement on the medical certificate of death, should be followed by all countries.

Dr. Percy Stocks remarked that the English form of medical certificate of death was introduced in 1927. About 1934 a large sample of certificates was taken for study and the proportion showing apparently satisfactory entries exceeded expectation. A small proportion of about 1.5 per cent had an obviously wrong sequence, and it was estimated that at least half of all wrong sequences must be detectable, so that the order of statement of causes was probably reversed in not more than 3 per cent. A smaller percentage showed other faults in the statement of multiple causes. It was concluded that the time had arrived for placing the responsibility for the order of statement on the doctor.

In view of the United States recommendation, the form of certificate to be proposed for international adoption was discussed in detail by the Expert Committee, and a draft was prepared as shown in Document WHO.IC/MS/28 (page 2)—which is reproduced herewith. In Part I is reported the cause leading directly to death (stated in line (a)) and also the antecedent conditions (lines (b) and (c)) which gave rise to the cause reported in line (a); the underlying cause being stated last in sequence of events. However, no entry is necessary in lines (b) and (c) if the disease or condition directly leading to death, stated in line (a), describes completely the train of events.

## INTERNATIONAL FORM OF MEDICAL CERTIFICATE OF CAUSE OF DEATH

CAUSE OF DEATH		Approximate interval between onset and death
<b>I</b>		
<i>Disease or condition directly leading to death*</i>	(a) .....	.....
	due to (or as a consequence of)	.....
<i>Antecedent causes</i>	(b) .....	.....
Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last.	due to (or as a consequence of)	.....
	(c) .....	.....
<b>II</b>		
<i>Other significant conditions contributing to the death, but not related to the disease or condition causing it.</i>	.....	.....
	.....	.....
*This does not mean the mode of dying, e.g., heart failure, asthenia, etc. It means the disease, injury, or complication which caused death.		

In Part II is entered any other significant condition which unfavourably influenced the course of the morbid process, and thus contributed to the fatal outcome, but which was not related to the disease or condition directly causing death.

Mr. J. T. Marshall pointed out that the present form of medical certificate of death was adopted in Canada in 1935 and follows closely that recommended by the League of Nations. Various changes have been made from time to time by different Provinces, but the actual "Cause of Death" section has remained unchanged except for the addition of columns for "duration" which have been added by seven of the nine Provinces.

In addition to preparing a draft form of medical certificate of death for international adoption, the Expert Committee:

- (1) Appointed a subcommittee to furnish an outline of rules for selecting the underlying cause of death for presentation to the International Revision Conference.
- (2) Adopted a form of Multiple Cause Tabulation, suggested by the United States Committee for use in tabulations around the census year (Document WHO.IC/MS/11).
- (3) Recommended the preparation of a series of teaching examples to illustrate the manner of completing the medical certificate of death.

The Final Report of the United States Committee on Joint Causes of Death (Document WHO.IC/MS/11) was presented to the International Revision Conference by Dr. Moriyama, at Dr. Dunn's suggestion, at the session over which Dr. F. S. Burke presided. A resolution, adopted by the Fifth International Conference for the Revision of the International List of Causes of Death in Paris in October, 1938, had obligated the United States Government to continue, during the interval 1938-48, its investigations into the problems

associated with joint causes of death. After the final report containing the results and conclusions of the preliminary report was read, Dr. Dunn intimated that the United States was prepared to change its present method of joint-cause selection in order to obtain a greater degree of international comparability.

The suggested form of Medical Certificate of Cause of Death for international use and the suggested form for Multiple Cause Tabulation by age and sex to be prepared by each country around the census year (Document WHO.IC/MS/29), and rules for the assignment of causes of death (Document WHO.IC/MS/34), were presented to the Conference by Dr. Thurber Fales.<sup>16</sup> Recommendations were submitted by the delegates from various countries, particularly Belgium, Canada, France and Switzerland, and these were referred to the Expert Committee.

At the Third Session of the Expert Committee in Geneva, May 4-7, 1948, the recommendations emanating from the Revision Conference were carefully considered. The final form of the Medical Certificate of Cause of Death, and rules for the selection of the underlying cause of death, were determined and incorporated in one document entitled "Medical Certification and Rules for Classification" (Document WHO.IC/MS/34.Rev.1). This will appear as one of the Chapters in Volume I of the Manual of the International Statistical Classification of Diseases, Injuries and Causes of Death to be published by the World Health Organization.

The final form of Multiple Cause Tabulation by age and sex was approved (Document WHO.IC/MS/29) and will enable each country to prepare a comprehensive table for the census year showing the number of times each cause of death was selected as the underlying (main) cause and as the contributory (secondary) cause of death.

As a result of the review of Parts I, II and III of the International Statistical Classification, the Expert Committee decided that the Manual which is to be published by the World Health Organization should be in two volumes.

Among the important items which Volume I will contain are:

- (1) Preface.
- (2) Introduction (including a historical review).
- (3) International Classification:
  - (a) List of three-digit categories (Detailed List), and
  - (b) Tabular List of Inclusions and fourth-digit subcategories.
- (4) Medical Certification and Rules of Classification.
- (5) Special Lists for Tabulation.
  - List A - Intermediate List of 150 Causes for Tabulation of Morbidity and Mortality.
  - List B - Abbreviated List of 50 Causes for Tabulation of Mortality.
  - List C - Special List of 50 Causes for Tabulation of Morbidity for Social Security Purposes.
- (6) Suggested Form of Multiple-cause Tabulation.
- (7) WHO Regulations regarding nomenclature.

The Alphabetical Index to the List of Inclusions will be Volume II.

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<sup>16</sup>Vice-Chairman of Expert Committee of WHO.

### 5. Future of Health and Vital Statistics

The deliberations of the Expert Committee at the second session brought to light many problems which could not be investigated due to lack of time, particularly international definitions of stillbirth and immaturity (prematurity) and cancer registration. Several countries had made specific requests for clarification of the stillbirth problem, and a communication from Denmark (Document WHO.IC 61-S) emphasized the need for international action in cancer statistics. It was considered necessary to recommend to the Interim Commission of the World Health Organization that a permanent Expert Committee on Health Statistics be formed to deal with the statistical aspects of cancer, and with any other problems of public health significance. Meantime, Denmark, France, Norway and the United Kingdom were requested to undertake preliminary investigations, as suggested by the Conference on Cancer Statistics, held in Copenhagen in September, 1946, and to make available to the Expert Committee the results of their detailed studies.

At the International Decennial Conference Dr. Dunn made a strong plea for international cooperation in health statistics and vital statistics. Considerable discussion ensued and the following recommendations were prepared for submission to the First World Health Assembly:

- (i) An Expert Committee on Health Statistics should be established for the study of problems in the field of health statistics, including recording of births, diseases and deaths, e.g., systematic study of multiple causes of death; residence allocation of vital data; methods of standardization of rates; and statistical problems associated with foetal and infant mortality.
- (ii) The establishment by governments of national committees for the purpose of coordinating statistical activities within each country, and to serve as links between the national medical-statistical institutions and the Expert Committee on Health Statistics of the World Health Organization.
- (iii) The allocation of studies of certain statistical problems of public health importance to interested national committees, e.g., Cancer Registry, Tuberculosis, Tropical Diseases, etc.
- (iv) The development of an efficient statistical section of the World Health Organization to furnish consulting services to national health administrations and statistical agencies.
- (v) International technical conferences to be convened when necessary on problems of vital and health statistics.
- (vi) The cooperation of specialized agencies of the United Nations.

A system of cooperation in health statistics as is envisaged should stimulate nations to conduct investigations into particular, circumscribed problems and avoid overlapping of effort by different organizations.

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# Canadian Journal of Public Health

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## ABSENTEEISM IN CANADIAN SCHOOLS

THE NATIONAL Committee for School Health Research has issued Report No. 3 on "Absenteeism in Canadian Schools."\* This is a joint effort of the Canadian Education Association and the Canadian Public Health Association. Dr. A. J. Phillips directed the study for the National Committee and has produced a report which will be studied with interest by educators and public health authorities everywhere.

The report is the result of a survey in Canada of the causes of absence from school of 15,323 pupils for a period of one school year. It required the active co-operation of over seven hundred school teachers who supplied the data required for the study. The causes of absenteeism are arranged according to age groups and sex of pupils, rural and urban environment, economic standards, racial origin, and occupation of parents.

Government agencies which expend money for health services for school children, through a public health school service and a planned curriculum of health teaching by the Department of Education, should have some index of the efficiency of their program. The report presents an analysis of the time lost from school by pupils because of medical and non-medical causes. Study of these figures will help to throw light on these problems. The report does not assess the health of the children, and in considering absenteeism due to medical causes it does not attempt to relate such absenteeism to the extent and quality of the school health services.

Similar projects are under way in California and in the United Kingdom, and the Canadian survey is being used as a pattern so that the results may be compared.

Dr. Phillips and the committee are to be highly commended for the report. It is to be hoped that the Canadian Life Insurance Officers Association, which provided financial assistance for the study, will continue its generous support so that the committee may proceed with this important work.

\*Copies of the report are available from the Canadian Education Association, 206 Huron Street, Toronto, Ontario, at \$1.00 each.



## TWO PIONEERS IN CANCER CONTROL

**W**ITHIN THE PAST FEW MONTHS Canada has lost two great leaders in the field of cancer control. Dr. Alan Blair, who died in Regina last November, was the outstanding leader in the cancer control program in Saskatchewan, the first province in which free diagnostic clinics and, ultimately, free treatment, were provided. The death of Dr. Gordon E. Richards, who was internationally known for his work in treatment and control, occurred in Toronto on January 13th. Both Dr. Richards and Dr. Blair had an important part in the establishing of the National Cancer Institute.

The story of Dr. Richards' work in this field is really the story of the extension and improvement of radiotherapy of cancer in Ontario and the development of a movement in Canada for adequate diagnostic and treatment facilities, the forwarding of research, and the dissemination of the established facts concerning treatment and prevention. He held four highly important positions. He was professor of radiology in the University of Toronto, director of the Ontario Institute of Radiotherapy, managing director of the Ontario Cancer Treatment and Research Foundation, and chairman of the Foundation's advisory medical board. As professor of radiology, he was recognized as the leading authority in Canada. He had early arranged for postgraduate training in radiotherapy leading to the Diploma in Radiology, granted by the Faculty of Medicine, University of Toronto, and through this postgraduate course had encouraged a number of young physicians to enter this field. As director of the Ontario Institute of Radiotherapy, he directed treatment in the largest centre in Canada and was adviser to the radiotherapists directing the work in the treatment and diagnostic centres throughout Ontario. As managing director of the Ontario Cancer Treatment and Research Foundation, a position the responsibilities of which would normally have required full-time work, he managed at much sacrifice to discharge all his duties and to give outstanding leadership. In this position he served without salary. Adding further to his work, he was chairman of the advisory medical board and a member of the Foundation. Dr. Richards took a leading part in the formation of the National Cancer Institute in 1947, helping to plan and establish a cancer control program on a national basis.

Dr. Richards was a man of untiring energy, a man with a consuming devotion to the cause of cancer control, and a man of rare administrative ability. His impatience at times with the progress made served only to highlight his enthusiasm. It was a great satisfaction to his many friends when Queen's University conferred on him an honorary degree of LL.D. in 1946. His address on that occasion will long be remembered.

Those who have the responsibility of attempting to fill the appointments made vacant by the passing of these two pioneers in the cancer control program in Canada are very conscious of the greatness of their contribution and of the extent of the responsibility. The organization of the public in every province in support of cancer control, the participation of the medical profession, the interest of public health authorities, and the financial assistance of the Federal and Provincial governments, are due in no small measure to the devotion of Dr. Richards and Dr. Blair.

## News

### Certification of Specialists in Public Health

PHYSICIANS engaged in the teaching and practice of public health and preventive medicine will be interested to know that the Royal College of Physicians and Surgeons (Canada) has approved the certification of specialists in public health and has selected a Committee on Certification in Public Health from nominations submitted by the Executive Committee of the Canadian Public Health Association. Dr. D. T. Fraser is chairman of the committee and the other members are Dr. George Walton, Regina, Dr. Chester Stewart, Halifax, Dr. Jules Gilbert, Montreal, and Dr. Baillie of the Association. Corresponding members will be selected to represent other sections of Canada.

The Committee is at present reviewing, with the Committee on Essential Requirements of the College, the standards for public health as laid down by the College. It is expected that an announcement of these requirements and the procedure for submitting application will be made in an early issue of the JOURNAL.

### The American Board of Preventive Medicine and Public Health, Incorporated

THE AMERICAN BOARD of Preventive Medicine and Public Health has been formed upon the recommendation of a joint committee composed of representatives from the American Medical Association and the American Public Health Association. These associations recommended the development of an organizing committee with the following membership: 3 members appointed by the American Medical Association, 3 members appointed by the American Public Health Association, 1 member appointed by the Canadian Public Health Association, 1 member appointed by the Southern Medical Association, and 1 member appointed by the Association of Schools of Public Health. Subsequent to incorporation, three additional members were elected representing practitioners of the specialty preventive medicine and public health.

The principal purposes of the Board as defined in the articles of incorporation are: (1) to encourage the study, improve the practice, elevate the standards and advance the cause of preventive medicine and public

health; and (2) to grant and issue, to physicians duly licensed by law to practise medicine, certificates of special knowledge in preventive medicine and public health.

The requirements for certification include general qualifications, such as moral and ethical standing in the profession, adequate training in medicine and internship in an approved hospital, and licensure to practise medicine in the United States or Canada. Eligibility for examination also requires that the applicant have special training and experience in preventive medicine and public health of at least six years following internship. This must include special academic training, or its equivalent, and field training or residency meeting the standards set up by the Board.

Applications may also be received for the Founders Group who may be excused from examination. The By-laws authorize a Founders Group made up of practitioners of preventive medicine and public health who have attained unquestioned eminence in the field. The Founders Group presumably will include persons having attained eminence as indicated by academic appointments at the level of professor or associate professor of preventive medicine and public health, or who have held positions of eminence and responsibility for a period of not less than ten years in this field.

The invitation to the Canadian Public Health Association from the organizing committee was welcomed, as close liaison between the specialty board in the United States and Canadian public health physicians is very desirable. Dr. Baillie represents the Association on the American Board.

Information about application to the American Board may be had at the offices of the Canadian Public Health Association or by writing directly to the Secretary-Treasurer of the Board, Dr. Ernest L. Stebbins, School of Hygiene and Public Health, 615 North Wolfe Street, Baltimore 5, Maryland.

### Canadian Dietetic Association

THE CANADIAN DIETETIC ASSOCIATION will hold its annual convention on June 15-17 at the Fort Garry Hotel, Winnipeg. The program will include group conferences pertaining to the many phases of food work, exhibits

of food and equipment, and papers by outstanding guest speakers and members of the Association. Further information may be obtained from Miss A. I. MacArthur, School of Home Economics, University of Manitoba, Fort Garry, Man.

### British Columbia

A PROGRAM for the control of arthritis and rheumatic diseases in British Columbia, offering special hospital beds, clinical services and mobile units for the treatment of patients, was announced March 13th by the Hon. George S. Pearson, Minister of Health and Welfare. Two main objectives are the provision of facilities for early diagnosis and care of those who may be expected to respond to modern treatment. A "pilot" scheme is already in operation in Vancouver, and it is hoped to expand it to cover the whole Province. A diagnostic treatment and research centre is to be opened at the Vancouver General Hospital this year, which will mean an expansion of out-patient facilities and a new in-patient ward of twenty or more beds. Two trained physical therapists and an occupational therapist are to be engaged and special equipment will be added to the clinic; a research assistant will also be appointed. Plans are under way for other diagnostic and treatment centres at Vancouver, Victoria, New Westminster and Trail. Mobile units are being trained to bring physical therapy treatment to patients unable to attend the centres or to visit their own physicians. The program will be supported by the B.C. Division of the Canadian Arthritis Society, the British Columbia Medical Association, the Chartered Physical Therapists, the Federal and Provincial governments, and from public contribution.

MISS HILARY CASTLE, a recent graduate of Stanford University, has been appointed to the staff of the Division of Health Education of the Provincial Department of Health and Welfare.

THE VERNON Jubilee Hospital, Vernon, and the provincial mental hospital, New Westminster, are the first hospitals in British Columbia to be assisted with money under the Federal Government's hospital building program. The Vernon hospital will have 120 beds. The 100-bed addition being built at the mental hospital will accommodate patients from the province and the Yukon.

SIX NEW OR ENLARGED hospitals are to receive assistance from the Dominion Government in meeting their building costs. These institutions are in Alert Bay, New Westminster, Murrayville, Fernie, Princeton, and North Vancouver. The combined increase in bed capacity totals 335.

SIXTEEN MORE APPLICATIONS for the post-graduate training of public health workers have been approved. This number includes eight physicians, four nurses, one nutritionist, two social workers, and one psychologist. Two of the physicians are taking diploma courses in public health at the School of Hygiene, University of Toronto, four are training in pathology, one in psychiatry, and one in hospital administration.

THE UNIVERSITY OF BRITISH COLUMBIA has been granted more than \$27,000 to expand its teaching facilities in clinical psychology, bacteriology, and preventive medicine.

TO INCREASE THE EFFECTIVENESS of its health program, the Province is planning to expand its health education work in Victoria and Vancouver. Three trained workers will be appointed to the provincial department and health education equipment purchased. In each of the two cities a health educator will be appointed to work under the supervision of the medical officer of health.

### Alberta

HOSPITAL CONSTRUCTION will be assisted with Federal funds in the enlarging of the Olds Municipal Hospital, Olds, and the building of the Three Hills Municipal Hospital, Three Hills. This construction fits into the over-all provincial program to extend hospital services. Each hospital serves approximately twelve townships.

ELEVEN MORE PERSONS are being aided in obtaining extra professional training in various aspects of public health. Four doctors are taking special studies in psychiatry. The remainder includes four nurses, an entomologist, a dietitian, and a medical records librarian.

ASSISTANCE WILL BE GIVEN to victims of poliomyelitis who are not already being aided under the Alberta Polio Sufferers Act of 1938. Under this act the Province pays the cost for treatment once the acute stage of the illness has been passed, for orthopaedic appliances and for rehabilitation. Now the same services will be given to adults and

children who contracted poliomyelitis prior to 1938.

TWO APPOINTMENTS have been made recently in the Division of Cancer Services of the Provincial Department of Public Health. Dr. Stephen Parlee of the Baker Clinic has been appointed gynaecological consultant to the Edmonton Cancer Diagnostic Clinics, and Dr. J. E. McAllister has been named gynaecological consultant to the Calgary Cancer Diagnostic Clinics. Both clinics are held on Fridays.

### Saskatchewan

ADDITIONAL STAFF and new equipment may be obtained for the Saskatchewan Hospital, North Battleford, for the psychopathic unit of the Regina General Hospital, and for the Saskatchewan Mental Hospital and the Saskatchewan Training School at Weyburn, with funds from the Federal Government's mental health grant. The plans approved call for an increase of eight psychiatrists, six graduate nurses, two occupational and two recreational therapists, one speech therapist, one technician, and one librarian.

EVERY PATIENT admitted to the larger hospitals and to most of the smaller hospitals in the province will receive a free chest x-ray. In addition, there will be an extension of mass x-ray surveys and the establishment of an x-ray reading centre. More widespread use will also be made of streptomycin and B.C.G. vaccine. The latter was pioneered in western Canada by Dr. R. G. Ferguson, formerly in charge of anti-tuberculosis work in the Province, and it has been used extensively throughout Canada by the Federal division of Indian Health Services.

THE LARGEST GROUP to benefit from the Federal grants for professional training are hospital accountants. A total of about 140 have attended a course of one week which has been given on four occasions, twice in Saskatoon on February 14 and 21, and twice in Regina on February 28 and March 7. The course was approved by the executive of the Saskatchewan Hospital Association.

ANOTHER GROUP to undertake special study is composed of candidates who will receive in-service training as sanitary inspectors. They will work with senior sanitary officers and at the same time study for certification by the Canadian Public Health Association.

TWO NUTRITIONISTS are to be hired to work in the health regions and a travelling

dietitian is to be appointed to assist hospitals throughout the Province. It is expected that the dietitian, acting in the role of a consultant, will be able to help improve the variety and quality of food served to patients and hospital employees and at the same time to lower costs of hospital administration.

CRIPPLED CHILDREN in Saskatchewan will receive aid through the services of the new Junior Red Cross Hospital. This will be operated as part of the new wing of the Regina General Hospital and will emphasize the treatment of cerebral palsy cases.

### Manitoba

RATEPAYERS OF HAMIOTA HOSPITAL DISTRICT have voted overwhelmingly in favour of the money by-law for the establishment of a new 26-bed hospital in the area. The hospital will be built in the Village of Hamiota. Passing of the by-law by a vote of 1,509 to 124 also provides for the erection of three smaller nursing units in Kenton, Oak River, and Miniota, subject to the approval of their municipal councils. Under the hospital construction grant, Hamiota will receive a total of \$42,000 from the Dominion and Provincial Governments. In addition, \$3,000 will be given by the Manitoba Pool Elevators. Further expenses will be met through direct municipal taxation. Hamiota is the fourteenth district to approve the Manitoba Department of Health hospital plan through a money by-law.

"CHOSEN CHILDREN", a bulletin telling the story of adoption in Manitoba, has lately been released by the Provincial Bureau of Health and Welfare Education. Stressing the importance of working through an authorized agency, this publication will be of special interest to all those wishing to adopt a child. Questions of heredity, length of waiting period, and problems of adjustment are discussed and the procedure for adoption outlined. Copies may be secured by writing to the Bureau of Health and Welfare Education, 320 Sherbrook Street, Winnipeg.

RATEPAYERS in the municipality of Whitemouth and the local government district of Reynolds recently voted on a by-law for the construction of a 10-bed medical-nursing unit to serve the 3,300 people of the district. The by-law passed with a majority of 92 per cent in Whitemouth and 86.2 per cent in Reynolds. Under the Manitoba health plan, Whitemouth unit will receive a total of

\$24,000 in Dominion-Provincial grants and, in addition, \$3,000 will be donated by the Manitoba Pool Elevators, and \$1,400 by the Winnipeg Electric. Further costs will be met by direct municipal taxation. The total cost of the hospital is estimated at \$60,400. When completed, the unit will contain ten beds, a case room and four-bassinets nursery, and offices for the local doctor, dentist, and public health nurse.

#### Ontario

DR. D. S. PUFFER represented the Department of Health of the Province at the recent meetings in Ottawa of the Dominion-Provincial Committee on Health Education and the Dominion-Provincial Committee on Nutrition. The former conference was held March 2-5; the latter, March 7-9.

DURING THE RECENT WAR the necessity of making the best possible use of man-power gave considerable impetus to industrial vision programs, especially in the United States. The problem boils down to two things: (a) determining the visual requirements for specific jobs, and (b) developing a rapid and certain method of selection. Various vision-testing instruments have been devised to meet (b), and a very considerable amount of work has been done by at least one of the instrument manufacturers to correlate the results of the tests with success on specific jobs. Some hundreds of American plants are continuing this service into the post-war period, and latterly a few Canadian industries have become interested. To gain information and experience, the Ontario Department of Health has recently installed one of these instruments (the Bausch and Lomb Ortho-Rater) in its Health Centre, to assist in assessing the vision problems of certain groups in the provincial service. The Division of Industrial Hygiene of the Department has been concerning itself for some years with health hazards related to the use of radium and other radio-active materials. One of the latest industrial applications of radium is a device for the elimination of static electric charges. The device finds its chief usefulness in the printing, paper and textile trades. All such installations in the Province are visited by an inspector of the Division to insure that safety and health precautions are observed.

A SURVEY to check methods of testing vision among school children in Hamilton is to be carried out by Dr. J. S. Kitching,

director of school medical services, with the assistance of an optometrist and an eye, ear, nose and throat specialist. The purpose of the study is to determine the extent and degree of visual defects among children who cannot yet read and to check the present system of making visual examinations with the object of improving testing methods. Between 200 and 300 children in kindergarten, grade one, and possibly grade two will be given the tests.

THE CANADIAN ARTHRITIS AND RHEUMATISM SOCIETY is planning a nation-wide program of professional and public education on the prevention, diagnosis and treatment of these ailments and the promotion of more adequate facilities for their cure. The informational program will be conducted through provincial divisions now in process of organization as well as through the national society.

THE FIRST SCIENTIFIC STUDY to be made in Canada of the effectiveness of sodium fluoride applied directly to the teeth will be carried out under the direction of Dr. M. A. Cox, professor of preventive dentistry at the University of Toronto. This study is in contrast to the two investigations of the effect of fluorine in drinking water being conducted at present in Brantford and Stratford. Two groups of children, about 300 in each group, will be chosen from a school in East York for the purpose of the survey.

THE HAMILTON GENERAL HOSPITAL is increasing its bed capacity by 181 to bring its total accommodation to more than 1,000. St. Peter's Infirmary, also in Hamilton, is extending its accommodation for the treatment of chronically ill patients by the addition of 51 beds, thereby bringing its bed capacity to 151.

THE MANY FRIENDS of Dr. Helen MacMurchy, C.B.E., learned with great pleasure of her election to represent Canada in the Hall of Fame at the Hobart and William Smith College, Geneva, N.Y. Thus she was named one of the ten leading women physicians in the western world. The occasion was the marking of the centennial of the graduation of Dr. Elizabeth Blackwell, the world's first women graduate from a school of medicine. Dr. MacMurchy was a pioneer in the field of maternal and child hygiene and served as director of the division in the Federal Department of Health when it was

established in 1919. She retired from official duties in 1934. In the field of mental hygiene also, Dr. MacMurchy was one of the early leaders, bringing together medicine and social work and championing the cause of the mentally handicapped.

THERE ARE thirteen tuberculosis sanatoria in Ontario, with 3,600 beds. These institutions are now officially classified as hospitals, making them eligible for maintenance grants which will total approximately \$800,000. Last year the Government paid more than \$2,000,000 towards the operating costs of sanatoria, but this amount did not meet the operating costs and almost \$1,000,000 was paid by the Province to meet the deficits.

### Quebec

OVER 650 ADDITIONAL SANATORIA BEDS will be provided for tuberculosis patients when present hospital construction is completed. At Three Rivers the Cooke Sanatorium is increasing its accommodation by approximately 175 beds which will be available for occupation by mid-summer. The Macamic Sanatorium, Abitibi, and the B  gin Sanatorium, Ste. Germaine du Lac Etchemin, are new institutions. The former will have 185 beds and the latter 300 beds for tuberculosis care.

ANOTHER PHASE of the tuberculosis control program is the provision of streptomycin without cost to all patients who may be benefited by the drug.

TWO HOSPITALS in widely separated parts of the Province will receive assistance from the national health grants. Together these two hospitals will provide more than 300 additional beds for active treatment of illness—228 in the enlarged St. Croix Hospital in Drummondville and 83 in the St. Sauveur Hospital being built in Val d'Or.

THE DIAGNOSIS and treatment of cancer in Montreal will be aided by Federal grants to the Institute of Cancer of Notre Dame Hospital and to the Herbert Reddy Memorial Hospital.

### New Brunswick

PUBLIC HEALTH continues to make great strides in New Brunswick, expanding services being carried out throughout 1947 and 1948.

The new Federal health grants are greatly stimulating the expansion program and already projects approved have reached the province's quota for crippled children, \$22,242; professional training, \$22,142; venereal disease control \$22,281; tuberculosis control, \$174,216, and health survey, \$27,454.

Cancer control projects have been approved to the extent of \$126,290, or 90 per cent of the total Federal assistance to which New Brunswick is entitled up to March 31, 1949, for this grant. The general public health grant stands at \$91,708, or 54 per cent, while mental health has reached \$81,705, which is 47.3 per cent of the allotment for this type.

Under hospital construction no New Brunswick grants have been approved yet, but it is anticipated that \$102,237 will be utilized before the Dominion fiscal year ends March 31st.

Latest of the new divisions established was that of Dental Health. On September 1st last, Dr. Robert S. Langstroth, Saint John, was appointed Director of Dental Health. He will assume his duties upon his return to Fredericton from the University of Toronto, where he is enrolled in the course leading to the Diploma in Dental Public Health.

Coming services now being studied or definitely planned include a mobile laboratory service for water and milk analysis in the field by the Sanitary Engineering Division, inclusion of Nutrition Services under a proposed Division of Maternal and Child Health, all needs for epidemiology being taken care of by the Division of Communicable Disease Control, with that of Venereal Disease Control being absorbed.

### Nova Scotia

THE GUYSBOROUGH MEMORIAL HOSPITAL, which will be completed soon, will serve a population of about 7,000. It is being financed partly by Federal and Provincial contributions and by the Canadian Red Cross Society.

### Prince Edward Island

THE NEW BEACH GROVE HOSPITAL near Charlottetown will provide an additional 249 beds for the treatment of patients with chronic mental illness.



*Thirty-third Annual Conference*  
ONTARIO HEALTH OFFICERS ASSOCIATION

Royal York Hotel, TORONTO

APRIL 25 and 26, 1949

*in Conjunction with the*  
*Annual Conference*

CANADIAN  
INSTITUTE OF SANITARY INSPECTORS  
(ONTARIO BRANCH)

MONDAY, APRIL 25—9.00 a.m.

ONTARIO HEALTH OFFICERS ASSOCIATION

Registration—Fee \$1.00

MONDAY, APRIL 25—9.30 a.m.

ONTARIO HEALTH OFFICERS ASSOCIATION

Concert Hall

**Chairman:** DR. GORDON PARK JACKSON, Medical Officer of Health, Toronto, and President of the Ontario Health Officers Association.

**Presidential Address.**

DR. G. P. JACKSON.

**Message of Welcome.**

The HON. RUSSELL T. KELLEY, Minister of Health of Ontario, and Honorary President of the Ontario Health Officers Association.

**Open Discussion of Current Problems. Changes in Public Health Legislation. Short Business Session:**

Appointment of Committee on Resolutions.

MONDAY, APRIL 25—9.00 a.m.

CANADIAN INSTITUTE OF SANITARY INSPECTORS  
(Ontario Branch)

Registration—Fee \$1.00



**MONDAY, APRIL 25—9.30 a.m.**

**CANADIAN INSTITUTE OF SANITARY INSPECTORS  
(Ontario Branch)**

**Chairman:** W. L. SMITH, C.S.I. (C.), Sanitary Inspector, Division of Industrial Hygiene,  
Department of Health of Ontario, and President of the Ontario Branch, C.I.S.I.  
**Address of Welcome.**

C. C. GOLDRING, M.A., D.Paed., Director of Education, Board of Education, Toronto,  
and member of the Board of Health, City of Toronto.

**A Day in the Life of a Sanitary Inspector in a Health Unit.**

WILFRED NAVION, C.S.I. (C.), Carleton Health Unit.

**The Relation of Public Health to Meat-Processing Plants and Locker Storages.**

N. A. FISH, D.V.M., D.V.P.H., Ontario Veterinary College.

**What the Health Official Should Know About the Newer Insecticides.**

J. A. CRUICKSHANK, Technical Sales Staff, Naugatuck Chemicals.

**MONDAY, APRIL 25—2.00 p.m.**

**ONTARIO HEALTH OFFICERS ASSOCIATION**

**Concert Hall**

**Chairman:** DR. G. P. JACKSON.

**Recruitment, Training and Selection of Public Health Personnel.**

R. G. STRUTHERS, M.D., D.P.H., Department of Health of Ontario.

**Discussion:**

F. W. JACKSON, M.D., D.P.H., Director, Health Insurance Studies, Department of  
National Health and Welfare, Ottawa.

**Trends and Advances in Paediatrics.**

JOHN HARRY EBBS, M.D., M.R.C.P. (Lond.), F.R.C.P. (C.), Senior Staff Physician,  
Hospital for Sick Children, Toronto; Assistant Professor of Paediatrics, University  
of Toronto.

**MONDAY, APRIL 25—2.00 p.m.**

**CANADIAN INSTITUTE OF SANITARY INSPECTORS  
(Ontario Branch)**

**Hall C**

**Business Session.**

**MONDAY, APRIL 25—8.00 p.m.**

**MEETING OF THE EXECUTIVE  
ONTARIO HEALTH OFFICERS ASSOCIATION**

**TUESDAY, APRIL 26—9.00 a.m.**

**ONTARIO HEALTH OFFICERS ASSOCIATION  
CANADIAN INSTITUTE OF SANITARY INSPECTORS**

**Concert Hall**

**Joint Chairmen:** DR. G. P. JACKSON and W. L. SMITH.

**Methods of Investigation in Food Handling Outbreaks.****Epidemiological Viewpoint—**

R. J. WILSON, M.A., M.D., D.P.H., Assistant Professor of Hygiene and Preventive Medicine, School of Hygiene, University of Toronto; Research Associate, Connaught Medical Research Laboratories.

**Collection of Samples. Laboratory Work.**

E. L. BARTON, M.D., Director of Laboratories, Department of Health of Ontario.

**The Application of Good Public Relations in a Health Agency.**

PETER G. GORDON, Publicist, Russell T. Kelley, Limited.

**Confusion and Stupidity in Nutrition Education.**

E. W. McHENRY, Ph.D., F.R.S.C., Professor of Public Health Nutrition, University of Toronto.

**TUESDAY, APRIL 26—12.30 p.m.**

**ONTARIO HEALTH OFFICERS ASSOCIATION****LUNCHEON****Concert Hall**

**Speaker:** DR. ROBERT D. DEFRIES, Director, School of Hygiene and Connaught Medical Research Laboratories, University of Toronto.

**Subject:** "Our Opportunity".

Tickets will be on sale at the Registration Desk.

**TUESDAY, APRIL 26—2.00 p.m.**

**ONTARIO HEALTH OFFICERS ASSOCIATION****Concert Hall****Public Health Aspects of Maternity.**

E. M. ROBERTSON, M.B., Ch.B., F.R.C.S. (Edin.), F.R.C.O.G., Professor of Obstetrics and Gynaecology, Queen's University, Kingston, Ontario.

**Screening for Visual Defect.**

(Speaker to be announced.)

**Business Session.**

**TUESDAY, APRIL 26—2.00 p.m.**

**CANADIAN INSTITUTE OF SANITARY INSPECTORS**

(Ontario Branch)

**Hall C**

**Meeting of Sanitary Inspectors, Conference Regions 1 to 6, under the Direction of the Division of Sanitary Engineering, Department of Health of Ontario.**

**TUESDAY, APRIL 26—7.00 p.m.**

**CANADIAN INSTITUTE OF SANITARY INSPECTORS**

(Ontario Branch)

**BANQUET**

**Speaker:** G. D. W. CAMERON, M.D., D.P.H., Deputy Minister of National Health and Welfare, Ottawa.

## Abstracts

### Nervous Factors in General Practice

TO-DAY, when problems of mental health and psychosomatic affections are receiving much attention, this appraisal of the mental, nervous and emotional factors in 1,000 unselected ambulatory cases submitting themselves for a general medical examination should be of wide interest. In 60 per cent physical causes were entirely responsible for the complaints; in 27 per cent complaints were purely nervous and mental in origin; in 13 per cent physical and neuropsychiatric disorders were associated.

That the illnesses represented in the 60 per cent group were without a mental component is, of course, not implied, but in these there was no nervous condition requiring special treatment. In the remaining 40 per cent there were 3 cases of psychosis and 7 borderline cases including 5 cases of mental depression, 75 cases of psychoneurosis and 321 cases with a benign nervous state. This latter group, constituting approximately 30 per cent and including chiefly patients with nervous exhaustion or fatigue, simple anxiety and nervous instability, are in general treated satisfactorily by the general practitioner provided he has the interest, tact, and patience, and is conversant with general up-to-date techniques in psychotherapy. In contrast, the psychotic and psychoneurotic cases usually require the skill and experience of the psychiatrist.

In this large series, then, there were only 10 patients with serious psychopathic disorders and a further 75 with psychoneuroses. The importance of distinguishing these and the much larger group (321) of benign nervous and emotional disturbances so that proper treatment, medical, psychiatric and social, may be applied is obvious. Some helpful hints in regard to diagnosis, nomenclature and treatment are given.

Frank N. Allan and Manuel Kaufman, *J.A.M.A.*, 1948, 138: 1135.

### Preliminary Report on the Beneficial Effect of Chloromycetin in the Treatment of Typhoid Fever

TEN CASES OF TYPHOID FEVER with positive blood cultures were treated with Chloromycetin by the oral route and the course of

their illness compared with that of eight untreated controls. Chloromycetin treatment was started on about the tenth day of fever in these cases and continued until the end of five days of normal temperature. Clinical improvement was apparent usually within 24 hours and the average treated case returned to normal temperature in 3.5 days. Untreated control cases averaged a further 26 days of fever.

Blood cultures, taken daily for 5 days and in 2 cases as early as 2 hours after the initial dose of the drug, were consistently negative. In 2 cases stool cultures were found positive during convalescence but further cultures were consistently negative. No patient was discharged without 3 consecutive negative stool cultures.

Relapses with bacteremia occurred in 2 of the 10 patients after afebrile periods of 10 and 16 days respectively. A second course of Chloromycetin brought about a prompt recovery. The organisms isolated during the recurrence exhibited no evidence of lessened *in vitro* sensitivity to the drug.

Theodore E. Woodward and others, *Ann. Int. Med.*, 1948, 29: 131.

### B.C.G. Vaccination of Indian Infants in Saskatchewan

IT WOULD APPEAR THAT everything humanly possible was done to ensure a fair trial of B.C.G. in this study which covered the period 1933 to 1945. The general background as well as the tuberculosis experience of these Indians for years previously was carefully assessed. Then families were selected and paired in respect to all factors likely to affect the health of the children and one member of each pair was assigned at random to one of two groups, designated Group A and Group B. All children born into Group A families in one year were vaccinated while all children born into Group B families were kept as controls. Each year thereafter this situation was reversed. Finally, groups of 306 vaccinated and 303 unvaccinated children were obtained, balanced in respect to age and environmental factors. Vaccination was by the intracutaneous method in all but 21 instances in which the oral route was used. Vaccination was carried out within 10 days

of birth and isolation was not practised. Exposure to active cases was relatively equal in the two groups.

Follow-up consisted of tuberculin tests in the control group, x-rays of both groups, a study of the general death rate and causes in both groups, and a determination of tuberculosis morbidity and mortality. Post-mortem examinations were used to establish cause of death whenever possible.

With this study pattern the results which follow would seem to carry weight. There were 6 cases of tuberculosis in the vaccinated group and 29 in the controls. Deaths from tuberculosis were 2 and 9 for the vaccinated and control groups respectively. These differences are highly significant. It would seem therefore that in this controlled study of B.C.G. vaccination of Indian infants at birth, the vaccine had conferred valuable protection in a highly infectious environment. In the controls the type of disease found was more serious and generalized than that in the vaccinated group.

R. G. Ferguson and A. B. Simes, *Tubercle*, 1949, 30: 5.

#### A Flocculation Test as a Possible Method for Differentiating Immunologic Types of the Poliomyelitis Virus

AN *in vitro* serological test for poliomyelitis virus has been a long-felt need and the test described in this paper may well mark an important advance in research in this disease. The antigen used consists of a purified, concentrated preparation of virus from the central nervous system tissue adsorbed on to protamine molecules, the amount of protamine for maximum precipitation being determined in preliminary tests. This antigen satisfied all requirements of specificity in rigid tests.

Reciprocal tests were carried out employing eight different strains of virus and their corresponding sera. The results indicated two distinct groups of poliomyelitis virus and agreed well with the results of monkey neutralization and immunity experiments. The method would seem therefore to offer a simplified and relatively inexpensive test for grouping of strains of poliomyelitis virus.

E. C. Roberts, *Pub. Health Reports*, 1949, 64: 212.

#### Penicillin and Caronamide in Resistant Subacute Bacterial Endocarditis

THIS REPORT gives an account of the successful control of three cases of penicillin-resistant subacute bacterial endocarditis by the use of oral caronamide (4' carboxyphenyl-methane-sulphonanilide) as an adjuvant to intramuscular penicillin. Caronamide serves to increase serum-penicillin levels by blocking penicillin excretion without damaging the kidneys. Whether the failure of penicillin alone in some cases is due to excessively rapid excretion or inaccessibility of the bacteria in the endocardial vegetations, the maintenance of serum-penicillin levels higher than usual appeared to aid chemotherapy. The results reported by previous workers, essentially similar to those given here, are noted and the appearance of toxic reactions to caronamide is discussed.

C. H. Stuart-Harris, J. Colquhoun, and J. W. Brown, *Lancet*, 1949, 256: 99.

#### Streptomycin in Gonorrhoea

STREPTOMYCIN would appear to be as effective as penicillin in the treatment of gonorrhoea and has the added advantage that it has very little effect on *Treponema pallidum*. It therefore becomes the drug of choice for treatment of cases of gonorrhoea where syphilis is suspect but not proved. While the masking of syphilis by penicillin may be of uncommon occurrence, the use of streptomycin presents a way out in place of the less effective sulfonamides. The author suggests its value in the following circumstances: cases with undiagnosed genital lesions or suspected false positive blood tests, in those persons with gonorrhoea who are known to have had recent intercourse with a syphilitic person, in the re-treatment of relapsing patients who showed Herxheimer-like reactions after the first treatment with penicillin, in cases in which it is desired that the period of subsequent surveillance should not exceed three months, and in fact in all cases of gonorrhoea in which the risk of existing but undiagnosed concomitant syphilis is greater than the average.

This comprehensive study of the role of streptomycin in venereology is accompanied by a number of interesting and illustrative case records.

R. R. Wilcox, *Brit. M.J.*, 1948, 32: 1015.

